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A Special Report to
The President and
The Congress

The Need for a National Plan of Scientific Exploration for the Exclusive Economic Zone

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A Special Report to
The President and
The Congress

The Need for a National Plan of Scientific Exploration for the Exclusive Economic Zone

National
Advisory
Committee on
Oceans and
Atmosphere

June 1986
Washington, D.C.

NATIONAL ADVISORY COMMITTEE
ON
OCEANS AND ATMOSPHERE
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

To the President and Members of Congress:

I have the honor of submitting to you the report of the National Advisory Committee on Oceans and Atmosphere (NACOA), "The Need for a National Plan of Scientific Exploration for the Exclusive Economic Zone."

President Reagan's Exclusive Economic Zone Proclamation of 1983 brought an enormous frontier region within the Nation's purview. Present sources of minerals and energy resources that are critical to our continued role as the leader of the Free World are now contingent on volatile political conditions in regions such as South Africa and the Middle East. There is also concern about the trade deficit caused, in part, by increased foreign commerce in these vital minerals and energy resources. For political and economic reasons, the Nation must address exploration of this frontier with a well-conceived and comprehensive scientific exploration plan.

In this study, NACOA recommends the development of a national plan for the scientific exploration of the Exclusive Economic Zone. The plan when implemented would provide information to assist in the orderly and safe development of the vast region. The study also defines the elements of the plan and outlines the roles of the government, industry, and academia.

NACOA is pleased to present our findings and recommendations, and we hope this effort will assist you in your work related to the future development of the U.S. Exclusive Economic Zone.

Sincerely,

John E. Flipse

John E. Flipse
Chairman

TABLE OF CONTENTS

	Page
FOREWORD	IX
EXECUTIVE SUMMARY	XI
1. INTRODUCTION	1
2. POTENTIAL OF THE EXCLUSIVE ECONOMIC ZONE (EEZ)	3
Offshore Oil and Gas	3
Fisheries	4
Non-energy Mineral Resources	4
Waste Disposal	5
Renewable Energy Resources	5
Pharmaceuticals from the Sea	6
Other Important EEZ Activities	6
Additional Considerations	7
3. ELEMENTS OF A NATIONAL SCIENTIFIC EXPLORATION PLAN	9
The Roles of Government, Industry, Academia, and Special Interest Groups	9
Elements of a National Plan	10
4. THE DATA CLASSIFICATION ISSUE	13
The NOAA Position	13
The Navy Position	14
The Ocean Industry Position	15
A National Academy of Sciences Analysis	15
The NACOA Position	16
Status of EEZ Classification Issue	16
5. CONCLUSIONS AND RECOMMENDATIONS	17
6. REFERENCES	25
APPENDICES	
A: Exclusive Economic Zone Proclamation	27
B: Presidential Statement on the Exclusive Economic Zone of the United States	29
C: Meeting Dates and Speakers	31

D: THE PRESENT NATIONAL EEZ EFFORT 33

The Federal Government 33
Department of Interior 33
National Oceanic and Atmospheric Administration 35
National Aeronautics and Space Administration 38
U.S. Navy 38
U.S. Coast Guard 39
National Science Foundation 39
Environmental Protection Agency 39
Department of State 41
Department of Energy 41
Ocean Industry 41
Special Interest Groups 44
Academia 45

E. GLOSSARY 49

F. NACOA Panel Members 53

List of Acronyms

CSO..... Coastal States Organization
DOI..... Department of the Interior
DOD..... Department of Defense
DOE..... Department of Energy
DOS..... Department of State
EEZ..... Exclusive Economic Zone
EPA..... Environmental Protection Agency
JOI..... Joint Oceanographic Institutions
LOS..... Law of the Sea
MOU..... Memorandum of Understanding
MMS..... Minerals Management Service
NACOA..... National Advisory Committee on Oceans and Atmosphere
NAS..... National Academy of Sciences
NASA..... National Aeronautics and Space Administration
NEPA..... National Environmental Policy Act
NESDIS..... National Environmental Satellite, Data and Information Service
NMFS..... National Marine Fisheries Service
NOAA..... National Oceanic and Atmospheric Administration
NOAC..... National Operations Security Advisory Committee
NOS..... National Ocean Service of NOAA
NSC..... National Security Council
NSB..... Naval Studies Board
NSF..... National Science Foundation
OCSLA..... Outer Continental Shelf Lands Act
OMA..... Ocean Mining Associates
OMB..... Office of Management and Budget
OSIM..... Office of Strategic and International Minerals
OTEC..... Ocean Thermal Energy Conversion
UNOLS..... University National Oceanographic Laboratory System
USCG..... United States Coast Guard
USGS..... United States Geological Survey
USN..... United States Navy

FOREWORD

Over 180 years ago, the Louisiana Purchase doubled the size of the Nation's territory. This region included the vast frontier that was later explored by Lewis and Clark. On March 10, 1983, President Ronald Reagan proclaimed sovereign rights for the United States over resources in the oceans out to 200 nautical miles from our coastlines. With this historic proclamation, the area of our Nation was doubled once more.

This new frontier region is called the Exclusive Economic Zone (EEZ). The concept of a national EEZ, as developed by customary international law and practices and then codified in the 1982 United Nations Convention on the Law of the Sea (LOS Convention), is now accepted as an established part of international law. Although the United States currently has no intention to sign the LOS Convention, nor has the Convention yet come into force, the EEZ established by the President's Proclamation is fundamentally in accord with the provisions of the LOS Convention. The proclamation does not affect existing jurisdiction concerning fisheries, under the Magnuson Fishery Conservation and Management Act, oil and gas resources under the Outer Continental Shelf Lands Act, or other marine resources covered under existing legislation or international treaty.

In May 1984, the National Advisory Committee on Oceans and Atmosphere (NACOA) noted this historic proclamation, stating "the significance of the EEZ to the future of our country may well be greater than the 1803 Louisiana Purchase acquisition -- considering the rate of depletion of the Earth's natural resources on land and the potential that the oceans are believed to have for addition to our resource base." The President's EEZ Proclamation claimed sovereign rights over all resources in this vast region, consistent with existing U.S. law and policy. NACOA believes that with such rights comes the responsibility to explore and monitor changes in the marine environment. Using this perspective, NACOA has conducted a study to address the question of the need for a national EEZ scientific exploration plan, the elements that should be addressed in such a plan, and roles to be played by the government and the private sector.

Exploration of the EEZ will entail the systematic surveying of over three million square nautical miles of ocean-covered frontier. Water depths range from shallow lagoons to the blackest depths of the abyssal ocean where, in some locations, remote-sensing devices must be employed to chart life, resources, and ocean processes. The potentially hostile nature of the environment will force us to rely upon modern technology, including remote sensing, to provide the data and information necessary to explore and ultimately describe the EEZ.

Although many of the resources of the EEZ have already been identified, a coordinated scientific exploration of the region should lead to the discovery of additional resources such as new sources of food,

gas hydrates, oil, gas, and hard minerals. Possible new uses of the EEZ include the development of marine pharmaceuticals, renewable energy generation, mariculture, and ocean incineration of toxic chemicals. Only a well-managed and comprehensive scientific exploration program can provide the information to policy makers necessary to evaluate potential uses, assist in resolving conflicts among users, and provide for the conservation of the ocean environment.

President Reagan's proclamation brings an enormous frontier region within the Nation's purview. Present sources of minerals and energy resources that are critical to our continued role as the leader of the free world are now contingent on volatile political conditions in regions such as South Africa and the Middle East. Concern is also focusing on the trade deficit resulting, in part, from increased foreign commerce in these vital minerals and energy resources. For economic and political reasons, the Nation must now address exploration of this frontier with a well-conceived and comprehensive scientific exploration plan.*

*This report uses the term "exploration" in a general sense which is different from the term as applied to Federal mineral related activities. Department of Interior regulations define exploration as the process of searching for minerals. Data collected by industry during mineral exploration must be held proprietary for a period of time. Data resulting from research studies, under the same regulations, will be made available to the public at the earliest practicable time. This report has as its focus the scientific exploration of the EEZ. This is to be distinguished from mineral exploration, as defined in Federal regulations, which is intended to lead directly to commercial development of a specific resource and which may involve the production of proprietary information.

EXECUTIVE SUMMARY

In May 1984, the National Advisory Committee on Oceans and Atmosphere (NACOA) stated "the significance of the EEZ to the future of our country may well be greater than the 1803 Louisiana Purchase acquisition -- considering the rate of depletion of the Earth's natural resources on land and the potential that the oceans are believed to have for addition to our resource base." From this perspective, NACOA has conducted a study to address the question of the need for a national scientific exploration plan, the elements that should be addressed in such a plan, and roles to be played by various governmental agencies, the private sector, and special interest groups.

The present government EEZ effort is represented by a number of worthwhile programs which are making important contributions. However, NACOA finds that the present structure of programs, with each agency having objectives dictated by its own mission, is not acceptable. The benefits to the Nation could be extended by associating these efforts with a national plan. There is a need for a national scientific exploration program for the EEZ in order to satisfy data acquisition needs, reduce overlap, and increase fiscal responsibility. Such a plan would also provide a more certain environment for industry investment. There is no such plan now in existence nor is there any agency developing a coordinated plan. The general philosophy recommended by NACOA is to formulate a plan that builds on or redirects existing programs and activities and essentially does not require increases in government resources and personnel.

NACOA THEREFORE RECOMMENDS THE DEVELOPMENT OF A NATIONAL PLAN FOR THE SCIENTIFIC EXPLORATION OF THE EEZ, TO PROVIDE INFORMATION WHICH COULD ASSIST IN THE ORDERLY AND SAFE DEVELOPMENT OF THIS VAST REGION, INCLUDING THE FOLLOWING GOVERNMENT FUNCTIONS AND PROGRAM ELEMENTS.

1. GOVERNMENT FUNCTIONS:
   - A. PROVIDE BASELINE ENVIRONMENTAL DATA
   - B. PROVIDE DATA AND INFORMATION FOR BROAD-SCALE RESOURCE AND POLICY EVALUATIONS
   - C. PROVIDE EFFECTIVE DATA AND INFORMATION MANAGEMENT AND EXCHANGE AMONG GOVERNMENT, INDUSTRY, AND ACADEMIA

2. PROGRAM ELEMENTS:
   - A. OCEAN BOTTOM MAPPING
   - B. GRAVITY, MAGNETIC, SEISMIC MAPPING
   - C. SEDIMENT CHARACTERIZATION
   - D. SEA-SURFACE AND WATER COLUMN CHARACTERIZATION
     - (1) BIOLOGICAL MAPPING
     - (2) PHYSICAL DATA
     - (3) CHEMICAL DATA
     - (4) METEOROLOGICAL DATA
   - E. DATA QUALITY AND INFORMATION MANAGEMENT

NACOA has reviewed the Nation's ongoing EEZ programs and activities, most of which are proceeding under the auspices of several agencies of the Federal Government. In total, they represent a framework of an effective EEZ scientific exploration plan. In NACOA's review of these ongoing EEZ activities, several observations were made.

In the President's 1984 State-of-the-Union address, he directed the Department of Interior to take a lead role in EEZ exploration. NACOA fully supports the overall goals of the Secretary of Interior to develop an integrated and comprehensive scientific understanding of the EEZ. The Committee further agrees with the U.S. Geological Survey (USGS) position that there is a clear and compelling need for basic scientific information concerning the resources and the geological processes of the EEZ.

The Committee has given careful consideration to the assignment of the leadership responsibility for the development of a national scientific exploration plan. The possible candidates within the Federal Government are the USGS and the National Oceanic and Atmospheric Administration (NOAA). Other organizations outside of the Federal Government were also considered. The USGS and NOAA have had an excellent working relationship in their EEZ efforts to date. NACOA believes that the major emphasis of the President's EEZ Proclamation was directed toward the hard mineral resources of the EEZ. This area of concern has been traditionally under the responsibility of the USGS. NACOA further finds that the traditional NOAA areas of concern such as living resources, environmental assessment, and coordination with the States is addressed in other legislation such as the Magnuson Fishery Conservation and Management Act and the Coastal Zone Management Act. The Proclamation does not reduce or modify these important NOAA roles. The major new NOAA EEZ effort developed in support of the Presidential Proclamation (i.e. multibeam bathymetric mapping) is now, however, undergoing a critical review, especially in Congress.

Of all the Federal, State, industry and special interest groups which gave briefings or other information to NACOA during its study of the EEZ, the USGS is clearly the best organized and furthest along in the non-living resources aspects of scientific exploration of the EEZ. The USGS has the necessary talent, personnel, and budget to initiate a national scientific exploration effort.

NACOA THEREFORE RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY (USGS) BE GIVEN A CLEAR POLICY DIRECTIVE BY THE ADMINISTRATION TO LEAD THE FEDERAL EFFORT FOR SCIENTIFIC EXPLORATION OF THE EEZ. THIS POLICY DIRECTIVE SHOULD TAKE THE FORM OF AN OFFICE OF MANAGEMENT AND BUDGET (OMB) CIRCULAR TO THE HEADS OF EXECUTIVE DEPARTMENTS. IN GENERAL, THIS CIRCULAR SHOULD OUTLINE THE POLICIES AND PROCEDURES FOR THE COORDINATION OF ALL FEDERAL EEZ SCIENTIFIC EXPLORATION ACTIVITIES. SPECIFICALLY, THE DIRECTIVE SHOULD:

1. **AFFIRM THE CENTRAL ROLE OF THE USGS WITH RESPECT TO EEZ SCIENTIFIC EXPLORATION,**

2. **CLARIFY THE RESPECTIVE RESPONSIBILITIES OF USGS, THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AND OTHER AGENCIES THAT HAVE IMPORTANT EEZ FUNCTIONS AND PROGRAMS,**

3. **ESTABLISH AN OFFICE WITHIN THE USGS TO COORDINATE THE SCIENTIFIC EXPLORATION OF THE EEZ. THE PRIMARY FUNCTIONS OF THIS OFFICE ARE TO WRITE A DETAILED 10-YEAR PLAN OF SCIENTIFIC EXPLORATION FOR THE EEZ AND TO DEVELOP AND COORDINATE THE IMPLEMENTATION OF THIS PLAN, AND**

4. **PROVIDE A MECHANISM FOR IDENTIFYING AND EVALUATING USER REQUIREMENTS IN A BALANCED AND INTEGRATED EEZ SCIENTIFIC EXPLORATION PLAN.**

The overall purpose of this OMB circular would be to integrate current and future scientific exploration efforts in the EEZ leading to the effective and economical accomplishment of mission requirements. In preparing, revising, and implementing the scientific exploration plan, the USGS EEZ Coordination Office will obtain the advice and assistance of the principal agencies, industry, and academic entities involved with EEZ exploration activities. For this purpose, the USGS EEZ Coordination Office should establish appropriate arrangements for obtaining advice, exercise the leadership in assuring that differences of opinion are resolved expeditiously, and, when important differences among agencies cannot be resolved, see that the agency heads concerned refer the issue to the appropriate office of the President for final disposition. The lead USGS role proposed by NACOA will be one of coordination; it is not intended to be autocratic. NOAA has an important leadership role regarding living marine resources and the physical sciences. NACOA believes that NOAA will take even more of an active role after the initial geological characterization of the EEZ has been done by the USGS. NACOA sees that future cooperation between the agencies could even be enhanced if USGS would, for example, take advantage of the NOAA fleet to assist USGS in its survey work in the EEZ. NACOA therefore believes that the excellent working relationship between the USGS and NOAA will not be adversely affected by the assignment of USGS to this lead coordination role.

NACOA FURTHER RECOMMENDS THAT THE SECRETARY OF THE INTERIOR SHALL TRANSMIT TO THE PRESIDENT AND CONGRESS, WITHIN ONE YEAR, THE U.S. GEOLOGICAL SURVEY 10-YEAR EEZ SCIENTIFIC EXPLORATION PLAN, WHICH INCLUDES:

1. **THE IMPLEMENTATION STRATEGY FOR THE NATIONAL PLAN,**

2. **A COMPILATION OF THE PROGRESS IN EEZ SCIENTIFIC EXPLORATION ACTIVITIES OF THE FEDERAL AGENCIES,**

3. **A STATEMENT GIVING A CLEAR DEFINITION OF THE ROLES OF THE GOVERNMENT, THE PRIVATE SECTOR, AND ACADEMIA REGARDING EEZ SCIENTIFIC EXPLORATION, AND**

4. **A REPORT ON HOW THE PUBLIC IS BEING INVOLVED IN EEZ SCIENTIFIC EXPLORATION PLANNING DECISIONS.**

NACOA concludes that a national scientific exploration plan cannot be carried out without sufficient Congressional oversight.

NACOA THEREFORE URGES CONGRESS TO EXERCISE THE APPROPRIATE CONGRESSIONAL OVERSIGHT AND ASSIST THE EXECUTIVE BRANCH IN THIS PROGRAM AND THUS HELP GUIDE THE NATIONAL EFFORT.

The volume of data acquired through the scientific exploration of the EEZ must be made available to users on a timely basis. Existing data banks appear to be inadequate to process and catalog new data from the EEZ. Data archival and data management activities represent an important element of a national scientific exploration plan. Industry, academia, and private organizations should be encouraged to submit their non-proprietary EEZ data to NOAA. In addition, government agencies, and government funded private industry and universities should be required to submit these data to the NOAA national environmental data centers. Accordingly,

NACOA RECOMMENDS THAT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ESTABLISH AN EXCLUSIVE ECONOMIC ZONE (EEZ) DATA MANAGEMENT OFFICE TO:

1. **DEVELOP A COMPREHENSIVE SET OF QUALITY CONTROLLED DATA FOR THE EEZ INCLUDING A COMPLETE ASSESSMENT OF THE CURRENT DATA BASE,**

2. **DEVELOP, IN CONCERT WITH THE U.S. GEOLOGICAL SURVEY OFFICE OF THE FEDERAL EEZ COORDINATOR, DATA MANAGEMENT POLICIES AND PLANS, AND**

3. **ASSURE AVAILABILITY OF DATA TO EEZ USERS THROUGH A SPECIFICALLY DESIGNATED DATA ACCESS SYSTEM.**

Although the main emphasis of this report is on non-living resources, NACOA recognizes that the NOAA National Marine Fisheries Service (NMFS) has an important scientific mission in the EEZ. This mission is administered under the Fishery Conservation and Management Act of 1976 within a 200-mile conservation zone that coincides with the EEZ. The NMFS provides data and scientific information on stock abundance, composition, location, and condition which is necessary for informed fishery management decision-making. NMFS laboratories perform a wide variety of scientific tasks including resource assessment, ecosystems analysis, experimental biology, basic science, and aquaculture research.

In other matters related to ocean science,

NACOA RECOMMENDS THAT USGS, WORKING WITH THE SCIENTIFIC COMMUNITY, DEVELOP A BASIC SCIENTIFIC RESEARCH PLAN. THIS WOULD BE A MAJOR COMPONENT IN THE NATIONAL EFFORT AND FORM A FIRM BASIS FOR THE SCIENTIFIC EXPLORATION OF THE EEZ.

NACOA FURTHER RECOMMENDS THAT USGS, AS A FIRST STEP IN THIS EEZ SCIENTIFIC RESEARCH PROGRAM, ASK A RECOGNIZED SCIENTIFIC ORGANIZATION, SUCH AS THE JOINT OCEANOGRAPHIC INSTITUTIONS, INC., OR THE NATIONAL ACADEMY OF SCIENCES, TO CONVENE A GROUP OF EXPERTS TO PRODUCE A NATIONAL MARINE RESEARCH PLAN FOR THE EEZ. THIS RESEARCH PLAN MUST BE INTEGRATED INTO THE USGS 10-YEAR EEZ EXPLORATION PLAN TO ASSURE A STRUCTURALLY SOUND PLAN THAT FITS OVERALL NATIONAL SCIENTIFIC NEEDS.

The National Science Foundation's (NSF) long-range plan for ocean sciences (NSF, 1985) identifies a number of areas of high priority research relevant to the scientific exploration of the EEZ. In addition, NACOA would encourage U.S. scientists and research institutions to devote more attention to scientific problems of the EEZ and to submit proposals to NSF reflecting this increased interest.

The present minimal formal involvement of State governments, industry, and academia in the national EEZ effort must be changed to include the aggressive use of the capabilities outside of the Federal Government.

NACOA THUS RECOMMENDS THAT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AND THE U.S. GEOLOGICAL SURVEY GIVE SERIOUS CONSIDERATION TO THE DEVELOPMENT OF JOINT INDUSTRY, ACADEMIA, AND GOVERNMENT COOPERATION REGARDING EEZ DATA COLLECTION AND PROCESSING PROGRAMS.

NACOA FURTHER RECOMMENDS THAT THE DEPARTMENTS OF INTERIOR AND COMMERCE CONTINUE THE JOINT SPONSORSHIP OF A BI-ANNUAL GOVERNMENT/INDUSTRY/UNIVERSITY WORKSHOP TO HELP BETTER REFINE FEDERAL GOALS AND TO PROVIDE A MECHANISM FOR SUBSTANTIVE RECOMMENDATIONS REGARDING:

1. **TYPES OF RESOURCE AND ENVIRONMENTAL DATA (PHYSICAL, GEOLOGICAL, BIOLOGICAL) NEEDED FOR THE EFFICIENT EXPLORATION OF THE EEZ,**

2. **TECHNOLOGY GAPS RELATED TO ACQUIRING THESE DATA, AND**

3. **PROGRAMS AND FUNDING SOURCES FOR FILLING IDENTIFIED TECHNOLOGY GAPS AND ACQUIRING NEEDED DATA.**

In concert with the wording of the Presidential EEZ Proclamation, regarding protection of the marine environment, one important aspect of a national exploration plan must be assurance that sound environ-

mental practices are followed during resource development. The collection of data to support this need is one major reason for the development of a national scientific plan.

NACOA finds that a special effort should be made to include coastal States and the public at large in the development of a national plan.

NACOA, THEREFORE, RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY OFFICE OF THE FEDERAL EEZ COORDINATOR SEEK ADVICE FROM STATES AND THE PUBLIC IN ITS NATIONAL EEZ PLANNING EFFORT.

NACOA realizes that adopting restrictions on multibeam bathymetric mapping, or other types of scientific data in the EEZ, could impede free exchange of scientific information. Scientific progress of our Nation is based on such freedoms. NACOA has also considered the national security argument on this issue and finds it to be more compelling than the argument for free exchange of scientific information and consequently recommends that security, on balance, should prevail. Thus, NACOA concludes that only the controlled dissemination of the NOAA data should be allowed. NACOA understands that certain interests may be somewhat impeded by this position, but the Nation must first protect its national security.

NACOA, THEREFORE, RECOMMENDS THE WIDEST PRACTICABLE DISSEMINATION OF THESE DATA, CONSISTENT WITH THE REQUIREMENTS OF NATIONAL SECURITY. IN THIS REGARD, A DATA DISSEMINATION MECHANISM MUST BE FOUND TO ALLOW, ON A CONTROLLED BASIS, THE RELEASE OF THE NOAA DATA TO SUPPORT VALID SCIENTIFIC RESEARCH AND INDUSTRY EXPLORATION.

NACOA realizes that one of the significant implications which will result from this recommendation, besides the immediate issue of restriction of product dissemination, is to complicate cooperative agreements NOAA might want to develop regarding the sharing of these data. The imposition of such controls could delay and impede developing the types of cooperative arrangements between NOAA and the private sector that NACOA also recommended.

NOAA may correctly argue that petroleum development and ocean mining require detailed "high resolution" bathymetric data prior to leasing and during actual operations. These data, including gravity, magnetic, and seismic profiling, are especially critical to petroleum exploration and development. These data, for specific areas, should be available on a need-to-know basis for United States users. NACOA agrees with the importance of such data, but does not find that the free and public dissemination of the NOAA data is in the best national security interest of the country. Other sources of these data (in the private sector) have been and will continue to be available to the oil companies.

1. INTRODUCTION

The United States has vital concerns with respect to the exploration of the Exclusive Economic Zone because of national security, resource development, environmental protection, marine transportation, and scientific inquiry issues. These concerns, exemplified by the President's EEZ Proclamation, point to the priority attention the Administration believes this region warrants.

With the Presidential Proclamation, nearly all living and non-living resources within 200 nautical miles of our coasts came under the public domain of the United States. Use of these resources and decisions concerning use conflicts have become, at least in part, a responsibility of the Federal Government on behalf of the overall public interest.

The known resources of the EEZ (including oil and gas, fisheries, and minerals), its potential uses (including waste disposal, renewable energy generation, and mariculture) and the value of yet undiscovered resources have made increased knowledge of the EEZ a major national concern. National security, in terms of both military and strategic resource perspectives, magnifies the future importance of the EEZ to the Nation.

Increased scientific understanding of the physical, chemical, and biological character of these ocean areas should lead to fuller economic development of this region. Thus, a national goal should be the development of a comprehensive scientific understanding of the EEZ as a basis for the formation of governmental management policies to ensure the optimum economic utilization of this region.

Given the proper economic and political climate, the EEZ should provide significant increase in national economic growth through the development of new industries, resources, and technologies. A national initiative is required to take advantage of these opportunities using the unique abilities of the academic, industrial, and governmental sectors.

The purposes of this report are to encourage the development of a coordinated, comprehensive 10-year program of scientific exploration and survey of the U.S. Exclusive Economic Zone in order to enhance commerce, resource exploitation, and the protection of the ocean environment. It is not the objective of this report to write a national scientific exploration plan for the EEZ, but only to provide definition of the important elements of such a plan. The report will also suggest a possible organizational structure for the development of a national plan.

A well-designed national plan should encourage private sector involvement and technological development, yet provide for environmental safeguards. Further, the elements of the national scientific exploration plan should be based on an analysis of the probable

resources and uses of the EEZ with advice from key public and private organizations.

Given this background, the objectives of this report are to:

1. review the known resources that the EEZ has to offer to our Nation,

2. review the present components of our national EEZ scientific exploration, survey, and resource assessment efforts,

3. identify the elements of a national scientific exploration plan, and

4. make a series of recommendations for the development of an integrated and coordinated plan of action for the scientific exploration of the EEZ.

2. POTENTIAL OF THE EEZ

President Reagan's historic proclamation staked a national claim on future economic use of the EEZ. In part, the Presidential proclamation resulted from a growing realization of the limitations of the Nation's land-based resources and the need to look seaward for replenishment as well as the need to manage EEZ resources for the overall national good. Our economic well-being into the 21st Century will depend to a large extent on the location and development of the offshore oil and gas resources, including gas hydrates, of the EEZ. Further, the Nation's three most critical strategic minerals -- cobalt, manganese, and nickel -- were discovered in significant quantities on the sea floor of our EEZ. The U.S. Geological Survey estimated the size of these deposits to be large enough to secure the Nation's strategic minerals supplies (USGS, 1984).

In addition to offshore petroleum and metallic mineral resources, other exploitable resources include fisheries, renewable energy sources, construction materials, and new products derived from the sea. The EEZ is also a potential repository for waste, an avenue for transportation, an area for military operations, and a region for scientific study.

Logic dictates that we need a systematic scientific reconnaissance of the EEZ if its resources are to be discovered and utilized in a responsible manner. At present our knowledge is inadequate, and no integrated national plan exists to ensure that this knowledge will be available in the future. A national scientific exploration plan must be articulated and executed in order to make advantageous use of EEZ resources. The following outlines a few representative present and future uses of the EEZ and may be considered as a starting point in the development of an understanding of its potential importance to the Nation.

Offshore Oil and Gas

In terms of strategic importance and economic value ($76 billion in cumulative revenues to the U.S. Treasury through 1984) the exploration, development, and production of offshore oil and gas resources will likely remain, into the next century, one of the most important economic activities in the EEZ. A significant portion of these resources lie undiscovered offshore in the EEZ (Sullivan, 1985).

The development of our vast offshore oil and gas resources, including gas hydrates, will provide the Nation with benefits, such as reduced dependence on foreign supplies, that transcend the purely monetary value of lease sale and royalty revenues to the Treasury. These benefits must be balanced against important environmental concerns that may complicate development planning. For example, environmental protection issues related to commercial fishing, endangered species, air quality, and coastal zone management have recently been a source of delay in leasing offshore lands for oil exploration and produc-

tion. These delays are sometimes related, at least in part, to the lack of detailed environmental data and information needed to make informed, timely, and accurate policy decisions. Other concerns of an economic and social nature also tend to complicate and delay offshore development of these resources. For example, the issue of revenue sharing with the States is of special concern at the present time.

Fisheries

In 1976, with the passage of the Magnuson Fishery Conservation and Management Act, the Nation extended its jurisdiction over the fisheries resources within 200 nautical miles of our coasts. Accordingly, foreign fishing has declined and domestic catches have increased (Gordon and Gutting, 1984). In some regions of the EEZ, such as New England, commercial and recreational fishing is the major offshore industry.

Our EEZ contains about one-fifth of the world's harvestable fish, worth about $2 to $3 billion annually to the Nation's economy (Gordon and Gutting, 1984). Joint ventures, in which domestic fishermen sell and deliver their catch to foreign processing vessels, have increased domestic fishing profits. Nevertheless, the Nation imports over $5 billion worth of seafood annually. Thus, a Nation with exclusive management control over one-fifth of the world's fishery resources has a trade imbalance in this segment of its economy. This perspective must be remembered as the Nation addresses the exploitation of this and other non-living resources of the EEZ.

Non-energy Mineral Resources

Important non-energy minerals may be located in resource quantities in the EEZ. These include sand and gravel, phosphorite, manganese nodules, cobalt-ferromanganese crusts, and polymetallic sulfides. Sand and gravel resources will grow in value as land-based sources are depleted. In all probability, this resource will be among the first mineral resource to be extracted from the EEZ in significant commercial quantities. Internationally, the demand for phosphorite, used in the production of fertilizers, is steadily increasing. Our Nation is a principal supplier of this resource. As economically and environmentally viable onshore deposits are exhausted, the offshore reserves of the EEZ may be tapped. Cobalt-rich manganese crusts, already discovered in quantity within the EEZ, have produced even more interest recently than the nodules. Also, within the last decade, metallic sulfides, of potential resource value, have been discovered in the EEZ. These sulfides were formed near volcanic "hydrothermal vents" and have been found to contain silver, zinc, copper, and iron in quantity (McGregor and Lockwood, 1985).

Waste Disposal

The ocean has long been used as a receptacle for wastes, since ocean waters have the ability to transport and mix disposed materials. In addition, because of the buffering capacity of the salts in the ocean, it has the natural capability to neutralize acid wastes. NACOA recommended in its January 1981 report, "The Role of the Ocean in Waste Management Strategy," that an integrated approach be adopted for waste management in which ocean disposal is one option to be given serious consideration (NACOA, 1981).

In scientific studies related to the fate of waste disposed of in the ocean, there has been extensive work on physical models of transport and dispersion processes. Considerable progress has been made. Additional work in this area of scientific research will lead to improved models that will actually enhance our decision-making ability regarding the disposal of toxic wastes in the ocean. Potential uses of the ocean for waste disposal currently being examined include ocean incineration, ocean dumping of treated municipal sludge, and disposal of radioactive wastes in high sedimentation areas.

The use of the EEZ for waste disposal, in a manner consistent with adequate environmental protection, is one of the potential uses to be considered along with other ocean uses.

Renewable Energy Resources

The world's oceans have temperature and salinity gradients, currents, waves, and tides, that are each potentially important as sources of renewable energy, especially for island and coastal regions. These energy sources are particularly attractive because of their renewable nature and the potential size of the resources. Extracting this energy from the ocean is an additional ocean use activity within the EEZ that would compete with fishing, petroleum exploration and development, ocean mining, navigation, recreational and military uses for available ocean space. Renewable energy resources may be economically recoverable only in certain areas which include nearshore and island regions in tropical and subtropical waters (for vertical temperature gradients), certain coastal inlets (for tidal resources), river outlets (for salinity gradients), and coastal regions with large persistent waves (such as the Gulf of Alaska). The most promising resource is the use of vertical temperature gradients in selected island and coastal regions. In addition, certain combinations of ocean energy projects offer very attractive prospects. For example, the combination of an Ocean Thermal Energy Conversion (OTEC) and a mariculture operation has been investigated. The Artificial Upwelling Project, formerly operating on the island of St. Croix, was one of this type. The cold water pumped to the surface for an OTEC operation resembled a natural upwelling process that had the effect of enhancing local biological productivity and thus increasing the success of the mariculture project.

Pharmaceuticals from the Sea

The pharmaceutical industry is continually looking for exotic compounds to be used as beneficial drugs. Drugs derived from marine organisms are not now commercially available. Yet of all the benefits that the EEZ holds, new drugs, that can be extracted from organisms within the waters of the EEZ, may represent an unexpected and potentially important source of these compounds (Whitesides and Elliott, 1984).

In addition, the application of biotechnology to the development of new products derived from marine organisms, including industrial chemicals, antifouling agents, and successful fish species for aquaculture, may provide a valuable harvest of protein and other important substances from the EEZ (Colwell et al, 1984).

Other Important EEZ Activities

In addition to the previously described ocean uses, other nationally significant activities occur in the EEZ that include the traditional high seas activities related to national defense and transportation, recreation, and scientific study. Although these activities would not likely be directly affected by the EEZ proclamation, the results of an EEZ scientific exploration could provide benefits to each.

National Defense. The oceans surrounding our Nation have historically provided a natural barrier to military invasion. A strong Navy increases the effectiveness of this natural barrier. Because of the Navy's need to understand its operational environment, it is and will continue to be a major contributor to the exploration of the EEZ. Data collected by the Navy could represent an important source of information for the national scientific exploration effort; conversely, in some cases, national defense needs may require classification of ocean data or information.

Transportation. Ocean commerce plays an important role in our Nation's economic well-being. Both tanker and cargo shipping into and out of U.S. ports will continue in response to domestic and international economic factors. Therefore, as we plan for increased utilization of the EEZ, we must realize that continued use of the EEZ for merchant shipping is a nationally important ocean use activity. Expanded scientific knowledge of marine winds, waves, and currents within the EEZ will be beneficial to the Nation's transportation needs.

Recreation. Recent years have seen an accelerated growth in coastal and ocean recreational activities. These activities, in addition to important economic value for some coastal communities, have high personal value to those who use these waters. These activities include sport fishing, diving and boating. Balanced planning for the exploitation of the resources of the EEZ must consider its uses for recreational purposes.

Scientific. Increased scientific understanding of the EEZ is fundamental to a national exploration and survey plan. The physics, biology, geology and chemistry of these waters must be understood to locate and exploit the resources of the EEZ in an environmentally acceptable manner. Pollution monitoring and assessment, living resource management, and resource mapping are examples of applications to which the scientific study of the EEZ can be applied. The responsibility for the nature and extent of scientific study of the EEZ lies almost entirely with the Federal Government, with a majority of the work funded by the lead federal agencies and the National Science Foundation.

Additional Considerations

When developing a national scientific exploration plan, two additional areas of concern should be considered. The first is the use of the data to make informed decisions regarding issues of importance to States, regional planning organizations, and for international policy affairs. The second is the use of these data to help resolve EEZ ocean use conflicts.

State, regional, and international factors will surely shape the Nation's policies as we start to explore the EEZ. For example, both access to fisheries and exploitation of non-living resources have all of these implications. Pollution and the management of living marine resources also have implications to States, regional organizations, and have global dimensions. As we plan to explore the EEZ, it is important to realize that data and information collected during the exploration program may become critical for future boundary negotiation.

The United States is a seagoing nation. National security concerns and economic factors (such as the need for cost effective supplies of oil and gas) will require increased utilization of the EEZ. With this increased use, conflicts between ocean users will tend to increase both in number and importance. These conflicts have the potential for limiting full resource utilization of the EEZ. At times, resource development and other ocean uses may be in conflict. For example, damage may be done to offshore fisheries by a major oil spill, or military uses may cause conflict with offshore oil development. Data collected during the scientific exploration of the EEZ will provide information to assist in making decisions concerning ocean use conflicts.

In the course of this study, the Committee also addressed an issue related to the scientific exploration of the EEZ and national security. The issue concerns the current requirement to classify certain data collected by civilian ocean agencies because of national security considerations. Chapter 5 relates NACOA's deliberations on this issue.

3. ELEMENTS OF A NATIONAL SCIENTIFIC EXPLORATION PLAN

In its May 1984 report, "The Exclusive Economic Zone of the United States: Some Immediate Policy Issues," NACOA proposed that a coordinated plan of action be prepared by the Executive Branch, including participation and contributions by all appropriate public and private institutions, for a 10-year "expedition" of research, exploration, and survey of our EEZ. NACOA further stated that it intended to review the elements needed for such a scientific plan.

The elements of the scientific exploration plan will be in part derived from currently known resources (including fisheries, petroleum, energy, and minerals) and uses (including ocean waste disposal, marine transportation, recreation and military operations) of the EEZ, modified by assumptions that not all potential resources nor uses are identified; such identification is the ultimate purpose of exploration. Other purposes are to create a body of knowledge that will permit future generations to make better use of the oceans, and to develop the information necessary to understand the interactions between the ocean waters of the EEZ and its atmosphere and lithosphere. Data resulting from the implementation of a national scientific exploration plan for the EEZ may assist in development of the EEZ and could enhance its economic benefits while promoting necessary conservation and assuring environmental safeguards. Data gathered during the course of exploration should lead to more educated decision-making regarding ocean uses.

The Roles of Government, Industry, Academia and Special Interest Groups

Government, industry, and academia all have important roles in the exploration of our EEZ. The Federal Government (both the executive and legislative branches working together) must provide the overall leadership for a systematic exploration plan in addition to meeting its critical scientific, resource assessment, technology development, and legal/policy responsibilities. Government scientists must institute the broad "strategic" studies and produce maps showing the general geological, physical, biological, and chemical characteristics of this region. The data and the derived maps should constitute the critical information necessary to make reasonable assessments of specific EEZ resources and should be central in making informed national policy decisions. The Federal Government should also aid in the funding of specialized data-gathering instrumentation, deployment of data-gathering platforms, quality control of data, and efficient and retrievable archiving of these data. Government agencies must ensure that these data, once collected and sanitized to remove national security concerns, are made available to industry and the academic community. The Congress must provide appropriate oversight to assist the executive branch in the development of the necessary scientific information and in the appropriation and authorization of the necessary funding. In addition, governmental policy must develop a broad framework of incentives with

necessary administrative and legal mechanisms under which other sectors of the economy can exploit commercially the resources of the EEZ in an acceptable manner.

Private industry must lead in the location of specific resources and evaluation of their commercial value. It must also make the determination of whether abundance is sufficient to take the risks necessary to exploit these resources. The industry role is thus to develop the tools necessary to assess, locate, and economically exploit a resource profitably with proper environmental safeguards.

The role of the academic community is in the areas of basic and applied research and engineering development. The short-term benefits for these efforts may sometimes be hard to quantify but, in the long-term, academic research could produce major contributions to the national EEZ exploration effort.

Special interest groups have a role in voicing the opinions of their constituents. Environmental organizations and those expressing concerns of the citizens of coastal States are two important groups whose input is important to the implementation of the national scientific exploration plan.

Elements of a National Plan

The need for a national plan arises from the requirement to acquire, record and disseminate baseline data and information about the EEZ in a coordinated and systematic fashion. This information will support informed policy decisions, be the basis for scientific studies, and enhance resource exploitation. NACOA has structured this report with the idea that the elements of the national scientific exploration plan should be considered as the scientific data and information that is useful for the economic development of the EEZ. These include:

1. ocean bottom mapping;
2. gravity and magnetic data, and seismic responses of the bottom and subbottom;
3. sediment characterization;
4. water column characterizations, including chemistry and physical data as well as biological content;
5. biological census and community mapping; and
6. ocean surface data, including near-surface meteorological data.

Data collection programs, that will complement data and information now available, should be designed to acquire the necessary additional information. These efforts should be planned in a systematic fashion, in a logical geographic manner, and with the data acquired made available to the public as well as the interested academic and industry communities. The collection program should be of sufficient detail and extensive enough to provide the necessary data base to make useful maps and form the basis for computer-generated process

modeling. NACOA realizes that given present Federal budgetary constraints, the development of the national scientific exploration plan should include provisions for:

1. the assessment and assembly of current data bases concerning the EEZ,

2. the coordination of ongoing research activities with the goal of standardization of data formats, and

3. government access to scientific data collected within the EEZ.

In addition, a well-conceived, effective, data quality and management plan will also be an important element of the national plan. Table 1 lists the elements of a national exploration plan and the need for each element for the spectrum of EEZ ocean uses and activities outlined in Chapter 2 of this report. The table allows inferences to be made regarding the relative importance of various elements in support of each ocean use and the across-the-board utility of each element for ocean uses in general. A number of EEZ programs, generally proceeding in the Federal Government, are now addressing some of the elements.

A national plan, in addition to having important data and information elements, must also consider the ongoing efforts of government agencies, industry, and the academic community in the overall framework of a coordinated national effort. It must be able to integrate the sometimes competing interests of these factions. The plan must identify roles and outline mechanisms that will enhance communication and cooperation among these segments.

NACOA sees four major government functions within a national EEZ scientific exploration plan.

The plan should:

(1) provide an initial baseline of environmental data necessary for the development of basic "road-maps," useful for assessing the potential effects of pollution, addressing ocean use conflicts, helping in identifying candidate marine sanctuaries and renewable resource regions, and producing the basic information necessary for increased scientific study of the region,

(2) provide physical, geological, chemical, and biological data for regional EEZ resource assessments,

(3) provide for effective data and information exchange among Federal agencies and State and local government, industry, and the academic community, and

(4) provide the basic infrastructure of ocean services necessary for resource exploration and development, including marine

weather and wave forecasts and general climatological products and inventories.

The general philosophy recommended by NACOA is to formulate a plan that builds on or redirects existing programs and activities and does not require major increases in government resources and personnel.

4. THE DATA CLASSIFICATION ISSUE

As part of its plans to survey the Exclusive Economic Zone (EEZ), the National Oceanic and Atmospheric Administration (NOAA) decided to develop detailed bathymetric maps of the ocean floor. This program uses the high resolution mapping technology, producing information applicable to minerals exploration, fisheries management, and scientific research. The U.S. Navy, and some within the geophysical exploration industry, believe that publication of certain of these data is contrary to their interests. The Navy views potential military uses by unfriendly nations as a reason to classify the NOAA data. As a result, the publication of these data and resulting products are currently in dispute.

The problem first surfaced early in 1984 when NOAA started to publicize its EEZ exploration plans. The Navy and the Defense Mapping Agency each voiced objections based on national security grounds. In September 1984, the problem was addressed during a House Merchant Marine and Fisheries Committee hearing on oceanographic research. This resulted in a classified Navy briefing on this issue to Congressional staff members. In October 1984, the NOAA Administrator received a letter from the National Security Council (NSC) maintaining that the detailed bathymetric data should be subject to review before release. In January 1985, the NOAA Assistant Administrator for the National Ocean Service brought the problem to the attention of NACOA and requested NACOA's assistance.

NACOA was subsequently briefed by NSC, NOAA, the U.S. Geological Survey (USGS), the Navy, and ocean industry representatives regarding this issue. The following is a brief summary of the respective positions of these parties, a summary of a National Academy of Sciences analysis of the problem, and a statement of the NACOA position on the issue.

The NOAA Position

The two major reasons for conducting the NOAA EEZ mapping program are the need for high quality bathymetric base maps to support economic development (i.e., oil and gas exploration and seabed mineral mining) and to form a data base for scientific research. New data will improve the quality of existing maps, especially offshore where measurements are sparse and the resolution of the data is poor due to former use of less sophisticated data collection and navigational positioning techniques. In addition, bathymetric mapping has become a major NOAA effort in the EEZ. NACOA was told, in January 1985, by the NOAA Assistant Administrator for the National Ocean Service, that the original (1984) NOAA position was that these data should be unclassified and freely exchanged. As the controversy continued, NOAA did agree, as part of a compromise, to a minimal level of classification. Proposed procedures for dissemination of the data are undergoing review at this time.

Another important dimension to the NOAA position was added by the NOAA Associate Administrator during a June 1985 presentation to the Marine Board of the National Research Council. He stated that if the NOAA data should have to be classified for security purposes, such requirements would substantially increase operating costs for the program, possibly draining from other important NOAA program funding. Also, data subsequently released to the public, having been degraded or filtered for security purposes, might be of less value, especially for research purposes and for industry. He concluded that NOAA should either be allowed to conduct its EEZ mapping program in an unclassified manner or else the agency should withdraw from the effort entirely. Furthermore, if the Navy's concern regarding classification is so great, it should develop the EEZ data base itself to the extent necessary for military purposes. This would allow for controlled access for selected users and the production of necessary sanitized data sets, at a small incremental cost for the Navy for specific users.

The Navy Position

NACOA was also briefed by the National Operations Security Advisory Committee (NOAC) of the National Security Council regarding the Navy position and concerns on this issue. Following is a summary of the Navy concerns.

According to NOAC, the detailed bathymetric data now being collected by NOAA and its derivative products, have potential military applications. Unrestricted release of data or products in an unclassified manner could seriously damage the national security interests of the United States. There does not appear, however, to be any serious Navy concern at this time about spot surveys by industry or academia, rather only with the complete coverage of the EEZ as planned by NOAA.

Detailed and highly accurate bottom contour data are collected and used extensively to support strategic and tactical naval operations. Accurate environmental data are essential to military operations. Such data are equally valuable to an adversary and should, therefore, be kept from any adversary to the maximum extent possible.

The NOAA data are of unprecedented accuracy and completeness. Moreover, because the results of the surveys are digitized, they are readily transferable, and, therefore, require controls on their release. Any potential of integrating the data into the international data bank managed by NOAA would provide other nations with militarily important information, without the expense involved in collection, without the political uproar that would occur should they undertake such a survey in our EEZ, and without having to subject their EEZ to a corresponding survey by the United States.

The Navy is expressly concerned over the prospects of an adversary power gaining access to bathymetric data that reveal in fine detail the features and characteristics of our whole EEZ. The Navy also

sees a potential problem in the proliferation of small-area surveys when organized into a complete data archival system.

The Ocean Industry Position

NACOA was briefed by members of industry, including the geophysical mapping and ocean mining industries, regarding this issue. The following summarizes industry concerns.

The ocean industry, in general, has no objection to the NOAA plans for the bathymetric surveying of the EEZ. The industry would prefer such data, if released, to be available in unclassified form. If this is not possible, industry would want the data to be made available selectively to civil users working in the national interest, subject to appropriate security safeguards.

Industry users stated that they would not be seriously inconvenienced by bathymetric data whose geographical coordinates were distorted by a random displacement of 100 to 200 meters. Certain users, however, would still desire access to the precise data in the immediate vicinity of a resource exploration project.

A National Academy of Sciences Analysis

In March 1985, the Naval Studies Board (NSB), of the National Academy of Sciences, at the request of Dr. George Keyworth (Science Advisor to the President), reviewed this issue. The questions addressed included the degree to which the public availability of the NOAA data poses a threat to national security and the means by which worthwhile academic and industrial needs for the data could be balanced against security concerns. The following summarizes the NSB findings based on its review of NOAA plans and NOAC concerns.

The NSB agreed with the NOAC concerns that NOAA proposed depth contour resolution (10-20m) and geodetic precision (50-100m) in their bathymetric charts would, if openly available, allow submarines to fix their position with precision.

Since the precision (or ambiguity) of each position fix will depend on the degree of local depth relief as well as on the accuracy and resolution of the charts, the NSB concluded that the NOAA survey charts proposed for publication do present a security threat for those regions of the EEZ with suitable topography. Given this concern, the NSB concluded that a conflict exists between a significant national security interest and other interests in allowing open dissemination of these charts at the highest resolution. One position suggested by NSB is to allow NOAA to issue products at full resolution in non-sensitive regions and filtered products (to an agreed threshold) in sensitive regions. The NSB concluded that some form of data management and dissemination control will have to be agreed upon between NOAA and the Navy in order to balance the

possible compromise to security against the benefits accrued from legitimate unrestricted use of the data.

The NACOA Position

NACOA has identified multibeam bathymetric mapping as an element of a national scientific EEZ exploration plan. NACOA realizes that adopting restrictions on this data, or other types of scientific data, would impede free exchange of scientific information. Scientific progress of our Nation is based, in part, on such freedoms. NACOA has also considered the national security argument on this issue and finds it to be more compelling than the argument for free exchange of scientific information and consequently recommends that security, on balance, should prevail. Thus, NACOA concludes that only the controlled selective dissemination of the NOAA multibeam bathymetric data should be allowed. NACOA understands that certain interests may be somewhat impeded by this position, but the Nation must first protect its national security interests.

Status of EEZ Classification Issue

A data classification policy review board has been instituted by the National Operations Security Advisory Committee (NOAC) to address this issue. Members of the board include the National Oceanic and Atmospheric Administration (NOAA), the Department of Defense, the Department of the Interior, academia, private industry, and NOAC. The chairman of NOAC, in basic agreement with the NACOA findings on this issue, has advised the Navy that he intends to recommend that NOAA's EEZ data base be given a classification of confidential. Further, work is also proceeding on the development of a technique to reduce data resolution such that NOAA can produce a publicly available product from the data in accordance with the NSB recommendations on this subject.

5. CONCLUSIONS AND RECOMMENDATIONS

The NACOA review of the elements of a National Plan of Scientific Exploration and ongoing components of the Nation's EEZ activities was initiated in response to the President's EEZ Proclamation. In its May 1984 report, NACOA stated that a national program of exploration and research concerning the EEZ and its resources should be initiated to provide a solid background of knowledge upon which to base appropriate future EEZ activities. Clearly it is in the national interest for the Federal Government, working with regional and State agencies, to constructively focus the activities of industry, academia, and private citizens toward the establishment of a coordinated national exploration effort.

The present government EEZ effort is represented by a number of worthwhile programs which are making important contributions. NACOA finds that the present structure of programs, with each agency having objectives dictated by its own missions, is not acceptable. The benefits to the Nation of these programs could be extended by associating these efforts with a national plan. There is a need for a national scientific exploration program for the EEZ in order to satisfy data acquisition needs, reduce overlap, and increase fiscal responsibility. Such a plan would also provide a more certain environment for industry investment. There is no such plan now in existence nor is there any agency developing a coordinated plan. The general philosophy recommended by NACOA is to formulate a plan that builds on or redirects existing programs and activities and essentially does not require major increases in government resources and personnel.

NACOA RECOMMENDS THE DEVELOPMENT OF A NATIONAL PLAN FOR THE SCIENTIFIC EXPLORATION OF THE EEZ, TO PROVIDE INFORMATION WHICH COULD ASSIST IN THE ORDERLY AND SAFE DEVELOPMENT OF THIS VAST REGION, INCLUDING THE FOLLOWING GOVERNMENT FUNCTIONS AND PROGRAM ELEMENTS.

1. GOVERNMENT FUNCTIONS:
   - A. PROVIDE BASELINE ENVIRONMENTAL DATA
   - B. PROVIDE DATA AND INFORMATION FOR BROAD-SCALE RESOURCE AND POLICY EVALUATIONS
   - C. PROVIDE EFFECTIVE DATA AND INFORMATION MANAGEMENT AND EXCHANGE AMONG GOVERNMENT, INDUSTRY, AND ACADEMIA

2. PROGRAM ELEMENTS:
   - A. OCEAN BOTTOM MAPPING
   - B. GRAVITY, MAGNETIC, SEISMIC MAPPING
   - C. SEDIMENT CHARACTERIZATION
   - D. SEA-SURFACE AND WATER COLUMN CHARACTERIZATION
     - (1) BIOLOGICAL MAPPING
     - (2) PHYSICAL DATA
     - (3) CHEMICAL DATA
     - (4) METEOROLOGICAL DATA
   - E. DATA QUALITY AND INFORMATION MANAGEMENT

NACOA has reviewed the Nation's ongoing EEZ programs and activities, most of which are funded by the Federal Government. In total they represent only a framework of an effective EEZ scientific exploration plan. These include a number of programs and activities. Some of these programs, which were reviewed by NACOA during the course of this study, were found not to be representative of the type of scientific exploration effort under direct consideration in this report. These programs are listed below with asterisks.

Government

1. The Department of Interior's
   A. geologic mapping and scientific studies
   B. leasing programs and environmental studies*

2. The National Oceanic and Atmospheric Administration's
   A. bathymetric mapping program
   B. data management activities
   C. sea floor research and studies programs
   D. fisheries research*
   E. strategic assessments program*

3. The combined National Aeronautics and Space Administration's and the National Oceanic and Atmospheric Administration's ocean satellite and program activities

4. U.S. Navy's defense operations and scientific programs*

5. U.S. Coast Guard's maritime safety, maritime law enforcement, environmental response, recreational, and defense activities*

6. The Environmental Protection Agency's waste disposal compliance monitoring*

7. The Department of State's international ocean program activities*

Private Sector

8. Ocean industry EEZ programs

9. Special interest group activities*

10. The academic community's scientific and policy studies

It is clear to NACOA that the Nation is proceeding with a number of important EEZ programs and activities. In NACOA's review of these ongoing EEZ activities several observations were made:

In the President's 1984 State-of-the-Union address, he directed the Department of Interior to take a lead role in EEZ exploration. NACOA fully supports the overall goals of the Secretary of Interior to

develop an integrated and comprehensive scientific understanding of the EEZ. The Committee further agrees with the USGS position that there is a clear and compelling need for basic scientific information concerning the resources and the geological processes of the EEZ.

A number of those that briefed NACOA pointed out that a national exploration plan must go beyond the strict geographic 200-mile limit of the EEZ. NACOA agrees with this, as important resource locations and offshore processes do not respect arbitrary boundaries and thus will require data collection efforts beyond this geographical limitation.

NACOA supports the position of the President not to exert jurisdiction over marine scientific research in the EEZ. This should facilitate access by our research fleet in the EEZ's of other nations.

The Committee has given careful consideration to the assignment of the leadership responsibility for the development of a national scientific exploration plan. The possible candidates within the Federal Government are the USGS and NOAA. Other organizations outside of the Federal Government were also considered. The USGS and NOAA have had an excellent working relationship in their EEZ mapping efforts to date. NACOA believes that the major emphasis of the President's EEZ Proclamation was directed toward the hard mineral resources of the EEZ. This area of concern has been traditionally under the USGS area of responsibility. NACOA further finds the traditional NOAA areas of concern such as living marine resources, environmental assessment, and coordination with the States has already been addressed in other legislation such as the Magnuson Fishery Conservation and Management Act and the Coastal Zone Management Act. The proclamation does not reduce or modify these NOAA roles. The major new NOAA EEZ effort, developed in support of the Proclamation, (i.e. multibeam bathymetric mapping) is now, however, undergoing a critical review, especially in Congress.

Of all the federal, state, industry and special interest groups which gave briefings or other information to NACOA during its study of the EEZ, the U.S. Geological Survey is clearly the best organized and farthest along in the non-living resources aspects of exploration of the EEZ. The USGS has the necessary talent, personnel, and budget to initiate the national exploration effort. There is need for unequivocal leadership in the Federal Government for accomplishing most of the task of exploration of the EEZ.

NACOA THEREFORE RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY (USGS) BE GIVEN A CLEAR POLICY DIRECTIVE BY THE ADMINISTRATION TO LEAD THE FEDERAL EFFORT FOR SCIENTIFIC EXPLORATION OF THE EEZ. THIS POLICY DIRECTIVE SHOULD TAKE THE FORM OF AN OFFICE OF MANAGEMENT AND BUDGET (OMB) CIRCULAR TO THE HEADS OF EXECUTIVE DEPARTMENTS. IN GENERAL THIS CIRCULAR SHOULD OUTLINE THE POLICIES AND PROCEDURES FOR THE COORDINATION OF ALL FEDERAL EEZ SCIENTIFIC EXPLORATION ACTIVITIES. SPECIFICALLY, THE DIRECTIVE SHOULD:

1. **AFFIRM THE CENTRAL ROLE OF USGS WITH RESPECT TO EEZ SCIENTIFIC EXPLORATION,**

2. **CLARIFY THE RESPECTIVE RESPONSIBILITIES OF USGS, THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA), AND OTHER AGENCIES THAT HAVE IMPORTANT EEZ FUNCTIONS AND PROGRAMS,**

3. **ESTABLISH AN OFFICE WITHIN THE USGS TO COORDINATE THE SCIENTIFIC EXPLORATION OF THE EEZ. THE PRIMARY FUNCTIONS OF THIS OFFICE ARE TO WRITE A DETAILED 10-YEAR PLAN OF SCIENTIFIC EXPLORATION FOR THE EEZ AND TO DEVELOP AND COORDINATE THE IMPLEMENTATION OF THIS PLAN, AND**

4. **PROVIDE A MECHANISM FOR IDENTIFYING AND EVALUATING USER REQUIREMENTS IN A BALANCED AND INTEGRATED EEZ SCIENTIFIC EXPLORATION PLAN.**

The overall purpose of this OMB circular would be to integrate current and future scientific exploration efforts in the EEZ leading to the effective and economical accomplishment of mission requirements. In preparing, revising, and implementing the exploration plan, the USGS EEZ Coordination Office will obtain the advice and assistance of the principal agencies, industry, and academic entities involved with EEZ exploration activities. For this purpose, the USGS EEZ Coordination Office should establish appropriate arrangements for obtaining continuing advice, exercise the leadership in assuring that differences of opinion are resolved expeditiously, and when important differences among agencies cannot be resolved, see that the agency heads concerned refer the issue to the appropriate office of the President for final disposition. The lead USGS role proposed by NACOA will be one of coordination; it is not intended to be autocratic. NOAA has an important leadership role regarding living marine resources and the physical sciences. NACOA believes that NOAA will take over more of an active role after the initial geophysical characterization of the EEZ has been done by the USGS. NACOA sees that future cooperation between the agencies would even be enhanced if USGS, for example, were to take advantage of the NOAA fleet to assist USGS in its survey work in the EEZ. NACOA therefore believes that the excellent working relationship between the USGS and NOAA will not be adversely affected by the assignment of USGS to this lead coordination role.

NACOA FURTHER RECOMMENDS THAT THE SECRETARY OF THE INTERIOR SHALL TRANSMIT TO THE PRESIDENT AND CONGRESS, WITHIN ONE YEAR, THE U.S. GEOLOGICAL SURVEY 10-YEAR EEZ SCIENTIFIC EXPLORATION PLAN, WHICH INCLUDES:

1. **THE IMPLEMENTATION STRATEGY FOR THE NATIONAL PLAN,**

2. **A COMPILATION OF THE PROGRESS IN EEZ SCIENTIFIC EXPLORATION ACTIVITIES OF THE FEDERAL AGENCIES,**

3. **A STATEMENT GIVING A CLEAR DEFINITION OF THE ROLES OF THE GOVERNMENT, THE PRIVATE SECTOR, AND ACADEMIA REGARDING EEZ SCIENTIFIC EXPLORATION, AND**

4. **A REPORT ON HOW THE PUBLIC IS BEING INVOLVED IN EEZ SCIENTIFIC EXPLORATION PLANNING DECISIONS.**

NACOA concludes that a national scientific exploration plan cannot be carried out without sufficient Congressional oversight.

NACOA THEREFORE URGES CONGRESS TO EXERCISE THE APPROPRIATE CONGRESSIONAL OVERSIGHT AND ASSIST THE EXECUTIVE BRANCH IN THIS PROGRAM AND THUS HELP GUIDE THE NATIONAL EFFORT.

In NACOA's review of the components and elements of a national plan of exploration a number of findings, conclusions, and recommendations related to individual programs and activities were developed.

Worthwhile EEZ exploration programs are now underway in DOI, especially in the U.S. Geological Survey (USGS). NACOA finds that a particularly important element of a national plan is the USGS 10-year EEZ exploration and mapping effort. NACOA agrees with the importance USGS has placed on the need for basic scientific information concerning the geologic processes of our EEZ and recommends continued support for this program. NACOA recognizes the major role that NOAA is playing in our Nation's EEZ exploration effort.

Although NACOA supports the NOAA bathymetric mapping program as a sound scientific effort filling an important EEZ need, difficulties regarding the data classification issue have slowed the program's progress. The NACOA findings on the classification issue have been presented in Chapter 5 of the report. NACOA believes that this critical mapping program should receive the necessary Administrative and Congressional support to carry it out in a timely fashion and to make the data available to users within the limits outlined by NACOA related to national security.

A second important NOAA EEZ program that, although it is not a exploration activity, will provide important information to decision makers is the NOS strategic assessment program. NACOA supports and encourages this effort as a necessary component of the national EEZ effort.

The volume of data acquired through the scientific exploration of the EEZ must be made available to users on a timely basis. Existing data banks appear to be inadequate to process and catalogue new data from the EEZ. However, data archival and data management activities represent an important element of a national scientific exploration plan. Industry, academia, and private organizations should be encouraged to submit their non-proprietary EEZ scientific data to NOAA. In addition, government agencies, and government-funded pri-

vate firms and universities should be required to submit these data to the NOAA archival system. Accordingly,

NACOA RECOMMENDS THAT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ESTABLISH AN EXCLUSIVE ECONOMIC ZONE DATA MANAGEMENT OFFICE TO:

1. DEVELOP A COMPREHENSIVE SET OF QUALITY CONTROLLED DATA FOR THE EEZ, INCLUDING A COMPLETE ASSESSMENT OF THE CURRENT DATA BASE,

2. DEVELOP, IN CONCERT WITH THE U.S. GEOLOGICAL SURVEY OFFICE OF THE FEDERAL EEZ COORDINATOR, DATA MANAGEMENT POLICIES AND PLANS, AND

3. ASSURE AVAILABILITY OF DATA TO EEZ USERS THROUGH A SPECIFICALLY DESIGNATED DATA ACCESS SYSTEM.

Although the main emphasis of this report is on non-living resources, NACOA recognizes that the NOAA National Marine Fisheries Service (NMFS) has an important scientific mission in the EEZ. This mission is administered under the Fishery Conservation and Management Act of 1976 within a 200-mile conservation zone that coincides with the EEZ. The NMFS provides data and scientific information on stock abundance, composition, location, and condition which is necessary to informed fishery management decision-making. NMFS laboratories perform a wide variety of scientific tasks including resource assessment, ecosystems analysis, experimental biology, basic science, and aquaculture research.

In other matters related to ocean science,

NACOA RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY (USGS), WORKING WITH THE SCIENTIFIC COMMUNITY, DEVELOP A BASIC SCIENTIFIC RESEARCH PLAN. THIS WOULD BE A MAJOR COMPONENT IN THE NATIONAL EFFORT AND FORM A FIRM BASIS FOR THE SCIENTIFIC EXPLORATION OF THE EEZ.

NACOA FURTHER RECOMMENDS THAT USGS, WORKING WITH THE SCIENTIFIC COMMUNITY, AS A FIRST STEP IN THIS EEZ SCIENTIFIC RESEARCH PROGRAM, ASK A RECOGNIZED OCEAN SCIENCE ORGANIZATION, SUCH AS THE JOINT OCEANOGRAPHIC INSTITUTIONS, INC., OR THE NATIONAL ACADEMY OF SCIENCES, TO CONVENE A GROUP OF EXPERTS TO PRODUCE A NATIONAL MARINE RESEARCH PLAN FOR THE EEZ. THIS RESEARCH PLAN MUST BE INTEGRATED INTO THE USGS 10-YEAR EXPLORATION PLAN TO ASSURE A STRUCTURALLY SOUND PLAN THAT FITS OVERALL NATIONAL SCIENTIFIC EEZ NEEDS.

The National Science Foundation's (NSF) long-range plan for ocean sciences (NSF, 1985) identifies a number of areas of high priority research relevant to the scientific exploration of the EEZ. In addition, NACOA would encourage scientists and research institutions to devote more attention to scientific problems of the EEZ and that they submit proposals to NSF reflecting this increased interest.

The present minimal formal involvement of State governments, industry, and academia in the national EEZ effort must be changed to include the aggressive use of the capabilities outside of the Federal Government.

NACOA THUS RECOMMENDS THAT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AND THE U.S. GEOLOGICAL SURVEY GIVE SERIOUS CONSIDERATION TO THE DEVELOPMENT OF JOINT INDUSTRY, ACADEMIA, AND GOVERNMENT COOPERATION REGARDING EEZ DATA COLLECTION AND PROCESSING PROGRAMS.

NACOA FURTHER RECOMMENDS THAT THE DEPARTMENTS OF INTERIOR AND COMMERCE CONTINUE THE JOINT SPONSORSHIP OF A BI-ANNUAL GOVERNMENT/INDUSTRY/UNIVERSITY WORKSHOP TO HELP BETTER REFINE FEDERAL GOALS AND TO PROVIDE A MECHANISM FOR SUBSTANTIVE RECOMMENDATIONS REGARDING:

1. TYPES OF RESOURCE AND ENVIRONMENTAL DATA (PHYSICAL, GEOLOGICAL, BIOLOGICAL) NEEDED FOR THE EFFICIENT EXPLORATION OF THE EEZ,

2. TECHNOLOGY GAPS RELATED TO ACQUIRING THESE DATA, AND

3. PROGRAMS AND FUNDING SOURCES FOR FILLING IDENTIFIED TECHNOLOGY GAPS AND ACQUIRING NEEDED DATA.

In concert with the wording of the Presidential EEZ Proclamation, regarding protection of the marine environment, one important aspect of a national exploration plan must be assurance that sound environmental practices are followed during resource development. The collection of data and information to support this need is one major reason for the development of a national plan.

NACOA finds that a special effort should be made to include coastal States and the public at large in the development of a national plan.

NACOA, THEREFORE, RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY OFFICE OF THE FEDERAL EEZ COORDINATOR SEEK ADVICE FROM STATES AND THE PUBLIC IN ITS NATIONAL EEZ PLANNING EFFORT.

NACOA realizes that adopting restrictions on multibeam bathymetric mapping, or other types of scientific data in the EEZ, could impede free exchange of scientific information. Scientific progress of our Nation is based, in part, on such freedoms. NACOA has also considered the national security argument on this issue and finds it to be more compelling than the argument for free exchange of scientific information and consequently recommends that security, on balance, should prevail. Thus, NACOA concludes that only the controlled dissemination of the NOAA data should be allowed. NACOA understands that certain interests may be somewhat impeded by this position, but the Nation must *first* protect its national security.

NACOA THEREFORE RECOMMENDS THE WIDEST PRACTICABLE DISSEMINATION OF THESE DATA, CONSISTENT WITH THE REQUIREMENTS OF NATIONAL SECURITY. IN THIS REGARD, A DATA DISSEMINATION MECHANISM MUST BE FOUND TO ALLOW, ON A CONTROLLED BASIS, THE RELEASE OF THE NOAA DATA TO SUPPORT VALID SCIENTIFIC RESEARCH AND INDUSTRY EXPLORATION.

NACOA realizes that one of the significant implications which will result from this recommendation, besides the immediate issue of restriction of product dissemination, is to complicate cooperative agreements NOAA might want to develop regarding the sharing of these data. The imposition of such controls could delay and impede developing the types of cooperative arrangements between NOAA and the private sector as also recommended in this study.

NOAA may correctly argue that petroleum development and ocean mining requires detailed "high resolution" bathymetric data prior to leasing and actual drilling operations. These data, including gravity, magnetic, and seismic profiling, are especially critical to petroleum exploration and development. These data, for specific areas, should be available on a need-to-know basis for use by United States interests. NACOA agrees with the importance of such data, but does not find that the free and public dissemination of the NOAA data is in the best national security interest of the country. Other sources of these data (in the private sector) have been and will continue to be available to the oil companies.

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Appendix A

EXCLUSIVE ECONOMIC ZONE OF THE UNITED STATES OF AMERICA

A Proclamation

WHEREAS the Government of the United States of America desires to facilitate the wise development and use of the oceans consistent with international law;

WHEREAS international law recognizes that, in a zone beyond its territory and adjacent to its territorial sea, known as the Exclusive Economic Zone, a coastal State may assert certain sovereign rights over natural resources and related jurisdiction; and

WHEREAS the establishment of an Exclusive Economic Zone by the United States will advance the development of ocean resources and promote the protection of the marine environment, while not affecting other lawful uses of the zone, including the freedoms of navigation and overflight, by other States;

NOW, THEREFORE, I, RONALD REAGAN, by the authority vested in me as President by the Constitution and laws of the United States of America, do hereby proclaim the sovereign rights and jurisdiction of the United States of America and confirm also the rights and freedoms of all States within an Exclusive Economic Zone, as described herein.

The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United Nations Trusteeship Agreement), and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. In cases where the maritime boundary with a neighboring State remains to be determined, the boundary of the Exclusive Economic Zone shall be determined by the United States and other States concerned in accordance with equitable principles.

Within the Exclusive Economic Zone, the United States has, to the extent permitted by international law, (a) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and non-living, of the seabed and subsoil and the superjacent waters and with regard to other activities for the

economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment.

This Proclamation does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction and require international agreements for effective management.

The United States will exercise these sovereign rights and jurisdiction in accordance with the rules of international law.

Without prejudice to the sovereign rights and jurisdiction of the United States, the Exclusive Economic Zone remains an area beyond the territory and territorial sea of the United States in which all States enjoy the high seas freedoms of navigation, overflight, the laying of submarine cables and pipelines, and other internationally lawful uses of the sea.

IN WITNESS WHEREOF, I have hereunto set my hand this tenth day of March, in the year of our Lord nineteen hundred and eighty-three, and of the Independence of the United States of America the two hundred and seventh.

RONALD REAGAN

Appendix B

Statement by the President On the Exclusive Economic Zone of the United States

(March 10, 1983)

The United States has long been a leader in developing customary and conventional law of the sea. Our objectives have consistently been to provide a legal order that will, among other things, facilitate peaceful, international uses of the oceans and provide for equitable and effective management and conservation of marine resources. The United States also recognizes that all nations have an interest in these issues.

Last July I announced that the United States will not sign the United Nations Law of the Sea Convention that was opened for signature on December 10. We have taken this step because several major problems in the Convention's deep seabed mining provisions are contrary to the interests and principles of industrialized nations and would not help attain the aspirations of developing countries.

The United States does not stand alone in those concerns. Some important allies and friends have not signed the Convention. Even some signatory States have raised concerns about these problems.

However, the Convention also contains provisions with respect to traditional uses of the oceans which generally confirm existing maritime law and practice and fairly balance the interests of all States.

Today I am announcing three decisions to promote and protect the oceans interests of the United States in a manner consistent with those fair and balanced results in the Convention and international law.

First, the United States is prepared to accept and act in accordance with the balance of interests relating to traditional uses of the oceans such as navigation and overflight. In this respect, the United States will recognize the rights of other States in the waters off their coasts, as reflected in the Convention, so long as the rights and freedoms of the United States and others under international law are recognized by such coastal States.

Second, the United States will exercise and assert its navigation and overflight rights and freedoms on a worldwide basis in a manner that is consistent with the balance of interests reflected in the Convention. The United States will not, however, acquiesce in unilateral acts of other States designed to restrict the rights and freedoms of the international community in navigation and overflight and other related high seas uses.

Third, I am proclaiming today an Exclusive Economic Zone in which the United States will exercise sovereign rights in living and non-living resources within 200 nautical miles of its coast. This will provide United States jurisdiction for mineral resources out to 200 nautical miles that are not on the continental shelf. Recently discovered deposits there could be an important future source of strategic minerals.

Within this Zone all nations will continue to enjoy the high seas rights and freedoms that are not resource-related, including the freedoms of navigation and overflight. My Proclamation does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction. The United States will continue efforts to achieve international agreements for the effective management of these species. The Proclamation also reinforces this government's policy of promoting the United States fishing industry.

While international law provides for a right of jurisdiction over marine scientific research within such a zone, the Proclamation does not assert this right. I have elected not to do so because of the United States interest in encouraging marine scientific research and avoiding any unneccessary burdens. The United States will nevertheless recognize the right of other coastal States to exercise jurisdiction over marine scientific research within 200 nautical miles of their coasts, if that jurisdiction is exercised reasonably in a manner consistent with international law.

The Exclusive Economic Zone established today will also enable the United States to take limited additional steps to protect the marine environment. In this connection, the United States will continue to work through the International Maritime Organization and other appropriate international organizations to develop uniform international measures for the protection of the marine environment while imposing no unreasonable burdens on commercial shipping.

The policy decisions I am announcing today will not affect the application of existing United States law concerning the high seas or existing authorities of any United States government agency.

In addition to the above policy steps, the United States will continue to work with other countries to develop a regime, free of unnecessary political and economic restraints, for mining deep seabed minerals beyond national jurisdiction. Deep seabed mining remains a lawful exercise of the freedom of the high seas open to all nations. The United States will continue to allow its firms to explore for and, when market permits, exploit these resources.

The Administration looks forward to working with the Congress on legislation to implement these new policies.

Appendix C

MEETING DATES AND SPEAKERS

Titles of each participant are listed according to the title held at the time of presentation to the Committee.

Meeting Dates and Speakers

December 11, 1984

William G. Gordon
Assistant Administrator
for Fisheries
NOAA

January 25, 1985

Dr. Terry Offield
Chief, Marine Geology
U.S. Geological Survey

Mr. John Rigg
Associate Director
Minerals Management Service
Department of Interior

Mr. Paul Wolff
Assistant Administrator
for National Ocean Service
NOAA

March 5, 1985

Carl H. Savit
Vice President
Western Geophysical Company

Ambassador James L. Malone
Assistant Secretary
Department of State

RADM Donald C. Thompson
Chief of Staff
U.S. Coast Guard

April 17, 1985

Richard Greenwald
General Counsel
Ocean Mining Associates

Juan Carlos Torres
President
Sea Pharm, Inc.

Dr. Harris B. Stewart
Director
Center for Marine Sciences
Old Dominion University

John F. Donnelly
Chairman
National Operations
Security Advisory Committee

June 4, 1985

Margaret E. Courain
Deputy Assistant
Administrator
for Information Services
NOAA

Dr. Tudor Davies
Office of Marine Protection
Environmental Protection
Agency

R. Gary Magnuson
Director
Coastal States Organization

July 16, 1985

Cliff Curtis
President
The Oceanic Society

Charles N. Ehler
Chief
Ocean Assessments Division
NOAA

Meeting Dates and Speakers

August 20, 1985

Dr. David Ross
Director
Marine Policy and Ocean Management
Program
Woods Hole Oceanographic Institution

RADM John D. Bossler
Director
Charting and Geodetic Services
NOAA

Appendix D

THE PRESENT NATIONAL EEZ EFFORT

As NACOA reviewed our Nation's EEZ efforts, the Committee was briefed by representatives of government, industry, academia, and special interest groups. These briefings produced the background information necessary to assess present and projected EEZ activities and helped NACOA make recommendations concerning the future roles of these sectors. This appendix will describe the roles of the present participants in the national EEZ effort.

The Federal Government

Over the last several months, NACOA has been briefed by a number of government departments and agencies that have major roles in the EEZ. These include the Department of Interior (DOI), the Department of Commerce through the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the U.S. Navy (USN), the U.S. Coast Guard (USCG), the National Science Foundation (NSF), the Environmental Protection Agency (EPA), and the Department of State (DOS). Each agency described its EEZ programs to NACOA and further identified elements that were considered important to the Nation's EEZ effort. One objective of this study is to review these programs and for NACOA to make recommendations, give encouragement, or voice concern where appropriate, regarding both the programs and the elements of a national exploration plan.

Department of Interior

Secretary of Interior Donald Hodel has stated, "the President has challenged the Department to move ahead with the efforts to map and explore the new frontier of the EEZ, so that we could develop and conserve our sea floor resources in an orderly manner." He further noted that "only through a unified effort using government, the academic community, and the States can we hope to build the national program needed to ensure that the EEZ is explored and developed wisely and in time to meet the demands of national resource needs." Following this, he described the overall goal of the DOI EEZ program as an effort to develop an integrated and comprehensive scientific understanding of the EEZ as a basis for formation of government policies. NACOA supports these goals as worthwhile and important to the Nation.

U.S. Geological Survey Programs

The U.S. Geological Survey (USGS) plays the lead role in the DOI EEZ effort. It is the USGS position that there is a clear and compelling need for basic scientific information concerning the configuration, resources, and geologic processes of the EEZ, a position with which NACOA fully agrees. The government must be the focus of action to address this need. The USGS points out that a national program, if

planned for 10 years of activity, would have the task of mapping, studying, and delineating resource potential of over 300,000 square nautical miles each year. The geologic baseline program proposed by USGS will form the basis for all national activities related to use of the sea floor and development of its non-living resources. Although this proposed program is to be managed by the USGS, it should involve many opportunities for cooperation with the Minerals Management Service (MMS), Bureau of Mines, National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), academia, and private industry.

The USGS is currently using the GLORIA (Geological LOng Range Inclined Asdic), a sidescan sonar to map the sea floor of our EEZ. [Footnote: The GLORIA system uses sound to locate and map variations of ocean bottom topography. The instrument is based on the principle that these variations will alter the amount of energy in the signal that bounces back to a receiver. The product of the system is an acoustical picture of the sea floor.] With GLORIA, large regions of the ocean floor can be mapped, giving a reconnaissance view of geomorphic and geologic features never before available. The resulting maps are very useful for finding the location of previously unknown features such as submarine volcanoes and canyons, and evaluation of sea floor processes.

The USGS EEZ 10-year scientific objectives are to provide:

1. inventory of the resource potential of the EEZ frontier regions for oil and gas, gas hydrates, polymetallic sulfides, cobalt, nickel, manganese, phosphate, and contruction materials,

2. inventory of the sea floor for special-purpose engineering locations,

3. definition of the geologic continental margins,

4. description and understanding of geologic framework of the EEZ, especially its continental shelf, slope, rise, and deep ocean basin, and

5. description and understanding of geologic processes of marine sedimentation and erosion, and of the occurrence of sea floor hazards.

Minerals Management Service Programs

The second DOI component involved in its EEZ effort is the Minerals Management Service (MMS). The MMS is responsible for the establishment of policies and procedures for managing the mineral resources of the Outer Continental Shelf (OCS). Legal authorization for the Department's management of the OCS is provided by the Outer Continental Shelf Lands Act (OCSLA), as amended in 1978. The MMS is responsible for implementing OCSLA policy to facilitate resource

exploration and development of the OCS in order to achieve national economic and energy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade. In practical terms, these objectives are carried out by MMS through the leasing of OCS areas believed to have oil and gas resource potential, by regulating resource exploration, development, and production operations on these leases, and by collecting bonuses, rentals, and royalties due to the Federal Government. While commercial activity until now has focused on oil and gas resources, MMS is also responsible for management of other OCS mineral resources.

The MMS does fund surveys in support of specific leasing proposals but does not conduct scientific surveys or mapping expeditions. For example, the MMS funded seismic data base is the most extensive in the Nation. MMS also manages and funds a multi-disciplinary environmental studies program in such areas as physical and biologicial oceanography and marine geology in support of activities associated with offshore leasing of Federal lands. These studies of MMS are valuable for both their basic science and resource management applications.

MMS has established an Office of Strategic and International Minerals (OSIM) to recommend policy and implement programs for exploration, development, and recovery of nonenergy minerals from the U.S. Outer Continental Shelf/Exclusive Economic Zone (OCS/EEZ). OSIM's activities are now focused on four areas: cobalt-rich manganese crust in the Hawaiian OCS/EEZ, polymetallic sulfides offshore of Oregon and California, phosphorite and heavy-mineral placer deposits offshore of North Carolina, and the development of a regulatory framework for non-energy minerals lease administration and mining operations. Many consider the development of non-energy resources under the OCSLA as unlikely. However, a recent announcement by the Under Secretary of Interior on alternative legislation which is now under consideration suggests that a more realistic legislative/regulatory regime will encourage earlier development of these resources.

The National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) has the responsibility for the Department of Commerce contribution to the national EEZ effort. Simply stated, the goal of the NOAA EEZ program is to provide environmental information for exploration, exploitation, conservation and management of natural resources, and protection and preservation of the marine environment.

The NOAA EEZ efforts include:

1. A National Ocean Service (NOS) bathymetric mapping effort,

2. An NOS strategic assessments program, which is producing a comprehensive atlas series of physical, biological, and other relevant information for the EEZ,

3. Data archival and dissemination activities of the NOAA National Environmental Satellite, Data and Information Service (NESDIS),

4. Scientific research efforts regarding sea floor processes, and

5. Fisheries management and scientific activities of the National Marine Fisheries Services (NMFS).

Bathymetric mapping of the EEZ is potentially an important component in an EEZ scientific exploration plan. These maps will help form basic decisions regarding the identification, assessment, and eventual production of EEZ resources. Modern bathymetric mapping systems are now being used by NOAA to systematically map the sea floor.

The major NOS mapping program objective is the preparation of high quality bathymetric data base and bathymetric maps for the EEZ. Two of NOAA's survey ships are equipped with multibeam swath surveying* systems. The NOAA Ships DAVIDSON and the SURVEYOR are equipped with these systems.

Also, with the President's proclamation, officials of NOAA and USGS have collaborated to develop a Memorandum of Understanding (MOU) defining their complementary roles in a cooperative EEZ program for bathymetric surveying. The MOU was signed by the Administrator of NOAA and the Director of USGS, in April 1984.

The following excerpts from the MOU highlight NOAA's responsibilities (through NOS) with respect to the cooperative program:

° NOAA has the lead role in the collection and dissemination of bathymetric data and products.

° NOAA will provide to USGS a magnetic tape file of bathymetry in standard NOAA format, with merged and corrected bathymetry and navigational data approximately one month after completion of each cruise dedicated to this program.

° NOAA will provide to USGS bathymetric maps derived from the data at a scale commensurate with the resolution of the data, as well as a digital magnetic tape of the contours in geographic coordinate.

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*Swath surveying technology uses multiple sonar beams to map a swath of the sea floor. Contours of sea floor relief can be produced by computer directly aboard the survey ship. The results of these surveys are very high resolution bathymetric maps.

Another important component of the NOAA EEZ program is also underway at NOS. In anticipation of both increasing interest in the development of resources of the EEZ, and the competition and inevitable conflict among various users of these resources, the NOS Ocean Assessments Division is conducting a national strategic assessment program for the EEZ.**

Data management must be considered as an important element of any national scientific plan of exploration for the EEZ. NOAA, the primary Federal agency charged specifically with the management of atmospheric and oceanic data and information, acquires, processes, archives, analyzes, and disseminates domestic and worldwide environmental (atmospheric, marine, solar, and solid Earth) data and information for use by commerce, industry, the scientific and engineering communities, the general public, and Federal, State, and local governments. In addition, NOAA operates World Data Center-A and participates in international data and information exchange programs. To carry out this mission, NOAA has a network of specialized data centers and a computerized environmental data and information retrieval service, including the National Geophysical Data Center which has responsibility for archiving and disseminating geophysical data.

With respect to data management, there are two areas of special concern to NACOA: 1) a comprehensive data management program should be a critical element of the national plan and, 2) the NOAA data environmental centers should have the lead responsibility for development of a National EEZ data management plan.

Two significant NOAA scientific programs are now underway in the EEZ. These are the hydrothermal venting program and the polymetallic sulfide program. The hydrothermal venting effort concerns the diverse effects of this process on the environment including the chemical, geological, biological, and physical oceanographic consequences of the venting of hydrothermal fluids at the sea floor. The venting process associated with polymetallic sulfides, which form in mid-ocean spreading centers, has been found important to the overall geochemical composition of the oceans. NOAA scientists and

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**This effort is unique within the Federal Government because of its comprehensive nature and the relationship of the data to national ocean policy issues. For example, a major effort was made in cooperation with the National Marine Fisheries Service to collect and synthesize information on the life histories of hundreds of commercially valuable fish in the EEZ. This type of information has proven particularly useful in providing guidance to legislative and regulatory bodies for decisions concerning ocean waste disposal site designation, permits under Title I of the Marine Protection, Research, and Sanctuaries Act, and oil spill risk assessments under the Outer Continental Shelf Lands Act.

NOAA-funded university researchers have conducted studies under this program since 1980 on the Gorda and Juan de Fuca Ridges in our Pacific EEZ.

Another NOAA EEZ program on which NACOA was briefed was that of the National Marine Fisheries Service. The NMFS develops and manages programs for the conservation, utilization, and development of the Nation's living marine resources. These programs fall generally under the responsibility of the Magnuson Fishery Conservation and Management Act and are managed within a 200 nautical mile fishery conservation zone that coincides with the EEZ.

In addition to these NOAA programs, Public Law 95-272 (the Ocean Pollution, Research, Development and Monitoring Act) gives NOAA the lead role in developing 5-year plans for coordinating marine pollution research. NOAA's efforts under P.L. 95-272 should contribute to the identification of priorities for the national scientific exploration plan.

National Aeronautics and Space Administration

The National Aeronautics and Space Administration (NASA) has a satellite oceanography program. NACOA has been briefed on a number of occasions on both the NASA and NOAA satellite oceanography programs. The NASA program consists primarily of research grants to universities that conduct scientific studies on the use of satellite data for oceanography. The NOAA program includes the development of services related to agency missions in ocean science. NACOA has expressed support for both efforts in the past and has reviewed the conclusions of the Joint Oceanographic Institutions Incorporated (JOI) report "Oceangraphy from Space: A Research Strategy for the Decade 1985-1995," (JOI, 1985).

A well-conceived national satellite oceanography program (as envisioned in the JOI report), although not designed for the EEZ alone, will be a key component of a national scientific exploration plan.

U.S. Navy

The mission of the Department of Defense (DOD) is to protect our Nation against foreign adversaries, including the protection of our citizens on the high seas. To carry out this mandate, DOD has to be able to operate above, on, and under the ocean waters of the EEZ. The U.S. Navy, as our major ocean operating service, must explore, survey, study, and understand the ocean environment. Accordingly, it spends a significant amount of the Nation's total ocean science budget in developing an understanding of the operational environment for its ships and aircraft. Some of the operational and scientific missions carried out by the Navy may prove to be of use in the overall national scientific exploration effort.

U.S. Coast Guard

The Coast Guard engages in a broad range of activities within the waters encompassed by the EEZ. These activities include:

- On-Scene Coordinator (for cleanup of offshore spills)
- Search and Rescue
- Enforcement of Laws and Treaties
- Aids to Navigation
- Merchant Marine Safety
- Ice Operations (including polar programs)
- Marine Environmental Systems (including port safety, security, and environmental protection)
- Recreational Boating Safety
- Defense Readiness
- Research and Development

Within its mission jurisdiction, the USCG has made a number of recommendations regarding factors to be considered in a national EEZ plan. Of these, NACOA finds the following of particular interest:

1. A complete mapping of EEZ exploitable fish stocks should be made to be used as an aid to making enforcement decisions; and

2. A survey of EEZ seabed minerals should be made to determine the initial locations, quantities, and projected timetables for extraction, as these may impact future USCG enforcement, marine safety, and navigational missions.

National Science Foundation

The National Science Foundation (NSF) briefed NACOA on its activities related to the EEZ. Although NSF does not have a specific EEZ program, about one-third to one-half of its Ocean Sciences Division budget is spent to support research projects within what comprises the U.S. EEZ. However, with few exceptions, NSF operates in response to specific proposals submitted by the academic community. For example, the NSF had special projects for the Antarctic and the International Decade of Oceanographic Exploration which produced significant scientific enthusiasm for work on related studies. NACOA suggested that if a major coordinated national scientific exploration plan were to be developed, there could indeed be an NSF scientific component.

Environmental Protection Agency

NACOA was briefed by the Environmental Protection Agency (EPA) concerning its programs in the EEZ. EPA's major activity in the EEZ is related to waste disposal. The primary role of the agency was described as permit compliance monitoring and environmental assessment related to waste disposal operations at a number of designated sites.

Table 1 The elements of a National Exploration Plan and the need of each element for a spectrum of EEZ ocean use activities

	Elements						
Ocean Uses	Ocean Bottom Mapping	Gravity, Magnetic Seismic Data	Sediment Characteristics	Water Column Data	Biologic Mapping	Ocean Surface Data	Data Management
Oil/Gas	X	X	X	X	X	X	X
Fisheries	X		X	X	X	X	X
Mineral Resources	X	X	X	X	X	X	X
Waste Disposal	X		X	X	X	X	X
Renewable Energy	X		X	X	X	X	X
Pharmaceuticals				X	X		X
National Defense	X	X	X	X	X	X	X
Transportation	X					X	X
Recreation	X		X		X	X	X
Scientific	X	X	X	X	X	X	X

The point was made that EPA disposal site monitoring must be supplemented by long term assessment programs such as those now being funded by the NMFS.

Thus, from EPA's perspective, in addition to site specific monitoring and assessment of waste disposal sites, one consideration in the development of the national plan should be a continuation of the NMFS long term assessment of the effect of pollution on living marine resources. In general, the EPA now plays largely a passive role in EEZ exploration, but as an agency it requires extensive baseline data for future assessments of the potential effects and impacts of EEZ exploitation.

Department of State

The Department of State (DOS) has as its primary interest in the EEZ to ensure that the United States derives maximum benefit from this region and that the Nation does not exceed its rights and jurisdiction under international law. NACOA was reminded by DOS that, in the President's EEZ Proclamation, it was decided not to exercise jurisdiction over EEZ marine research in order to encourage international marine scientific study. DOS pointed out that the U.S. conducts more research in foreign waters than any other country in the world. As such, it is to our advantage to have foreign EEZs unrestricted and accessible for research purposes.

A serious problem for our marine scientists is the practice of restricting access to areas within foreign EEZs because of oil, gas, and other mineral development, sanctuaries, and military zones. Some foreign governments have already restricted or denied research activities of our scientists off their coasts. It should be remembered that while the United States has supported the least possible restraint on scientific research, our Nation, as well as other governments, must protect the economic interests especially regarding the resources of the respective EEZs. In developing a national scientific exploration plan DOS recommends that full consideration be given to research interests and that reciprocity considerations be evaluated before any regulations or policies are developed.

Department of Energy

The Department of Energy (DOE) has ocean programs that represent portions of our Nation's efforts in the EEZ. Two noteworthy examples include DOE responsibilities under the Deep Seabed Disposal Program and those outlined in the Arctic and Offshore Research Program Plan. The latter calls for data collection, and research to enhance energy development in the Arctic.

Ocean Industry

Over the last several months, NACOA has been briefed by representatives of industry, special interest groups and academia. Each

identified factors it considered important in the development of a national plan. A short review of these briefings may put their concerns into perspective.

Representative members of some ocean industries briefed NACOA. These were Ocean Mining Associates, Sea Pharm Inc., and Western Geophysical Company of America.

Ocean Mining Associates. Ocean Mining Associates (OMA) is an international organization involved in deep ocean mining. An exploration license was issued to OMA by the U.S. Department of Commerce (NOAA) in 1984, authorizing them to exercise all rights and privileges of an exploration licensee under the Deep Seabed Hard Mineral Resources Act of 1980.

NACOA was informed that the principal problem facing the ocean mining industry today is the status of the metals markets. The last decade has been a time of decreased metals demand, rising production costs, falling metal prices, and increasing use of plastics and other substitutions, all of which affect demand for nickel, cobalt, copper and manganese - the principal metal markets ocean miners seek to enter. In many cases, land producers of these metals have been curtailing or ceasing operations at existing low-cost production facilities in the face of rising unsold inventories. At the same time some "nationalized" operations have increased production of these metals and ores in attempts to save jobs and make up for falling revenues.

In this economic environment the privately funded ocean mining industry has retrenched. Investment has been reduced to a minimum survival level. The technology and the skills await improved market conditions.

Those in the ocean mining industry have the view that markets will be found for marine minerals in the future decades. It is also their view that the United States may well need a domestic supply of strategic metals due to political, military and economic necessity. This might occur at a time before free-market conditions alone can justify commercialization, keeping in mind that purely commercial time scales would envision first production of marine-derived metals sometime in the early 1990s if aggressive development activity were initiated now.

NACOA has reviewed aspects of the ocean mining industry and finds that the following functions represent the proper division of EEZ hard mineral development responsibilities between government and the private sector:

1. Mineral Resource Assessment

Government - Map the topography and do general mineral reconnaisance. Acquire the baseline environmental data required for use in making national policy determinations.

Private Sector - Locate (at a time determined by market forces) suitable mineral occurrences and confirm that they contain reserves of sufficient quality and quantity to provide a reasonable expectation of return of investment and a profit commensurate with projected risk. Develop the necessary technology to recover the resources.

2. The Law and Policy

Government - Provide the framework of incentives, law, administrative practice and taxation within which environmentally and economically sound development and commercialization may take place. Enunciate national policies and objectives concerning EEZ resources.

Private Sector - Inform the government as to whether the proposed framework of the law, taxation, and administrative practice under which such development and commercialization will take place is sufficiently fair (economic) and predictable as to permit prudent investment.

Sea Pharm, Inc. Of the wealth of resources that will be extracted from the EEZ, new pharmaceuticals may provide an important harvest. NACOA was briefed concerning present technologies and future prospects by Sea Pharm, Inc. of Princeton, New Jersey, a biotechnology company engaged in pharmaceutical research using marine organisms as a source of new therapeutic agents. Sea Pharm is associated with the Harbor Branch Foundation, an oceanographic research institution based at Fort Pierce, Florida, which has developed many research tools (including specialized submersibles) that make possible exploration of the sea for pharmaceutical products.

This representative of the pharmaceutical industry pointed out to NACOA that natural products, which account for about half of all new prescriptions, are essentially all obtained from terrestrial sources. However, over three-fourths of all of the Earth's animal life is found in the marine environment. This is, therefore, a rich source of pharmaceuticals which has not yet been tapped.

Two of Sea Pharm's recommendations on this developing industry which are of particular relevance to a national scientific exploration plan are:

1. there should be a general resource characterization of the EEZ regarding species abundance, especially in areas of particular interest, and

2. the sea pharmaceutical industry is international in scope. We should continue efforts to facilitate the visits of our scientific research vessels to foreign waters, perhaps by maintaining the policy of allowing foreign scientific research vessels access to our EEZ with relative ease.

NACOA realizes that there is a difference between a scientific vessel trying to gain access to our EEZ for research purposes and a commercial company that is harvesting pharmaceuticals (or other resources) in our EEZ for a profit. The latter would, of course, require the proper permits and clearances to harvest these resources.

Western Geophysical Company of America, Inc. Western Geophysical Company of America, Inc., briefed NACOA regarding selected aspects of the Nation's geophysical mapping industry. This is a $2 billion industry which operates 100 to 150 survey vessels worldwide. The data that is collected is sold mainly to oil companies at a profit. The main points of the briefing pertained to geophysical (seismic, gravity, magnetic) data for the EEZ. These were:

1. DOI permit requirements obligate companies to turn over data collected for the government upon request, which may then be made available to the public after a number of years;

2. There also is concern, expressed to NACOA in the geophysical mapping industry and by Western Geophysical Company of America, regarding the potential lack of security and ultimate protection of geophysical data given to the government; and

3. Western Geophysical Company of America stated that it is not appropriate, especially in times of budget cuts, for the government to collect and disseminate geophysical data for the EEZ when such data can either be purchased from industry or will shortly become available through industry arrangements with government.

Special Interest Groups

Representatives of two special interest organizations briefed NACOA regarding the elements of a National Scientific Exploration Plan. They were the Oceanic Society and the Coastal States Organization. The Oceanic Society is an environmental organization whose principal interest is protection of our oceans and their resources.

The Oceanic Society. The Oceanic Society made several suggestions for use in developing a National Scientific EEZ Plan specifically related to the protection and conservation of the marine environment. These points proved useful to NACOA in its analysis of needs for the EEZ.

These included:

1. Consistent with the principles underlying the National Environmental Policy Act (NEPA), EEZ-related research should give priority to incremental, cumulative, chronic and indirect impacts associated with ocean use activities;

2. Intensive research and monitoring is needed with respect to land-based activities which pollute coastal areas and degrade critical habitats, given the importance of these areas to our EEZ fisheries;

3. Research is needed to address clean up and mitigation measures that would be effective in response to accidental or operational spills or other polluting activities that might occur in the EEZ;

4. Consideration should be given to the establishment of a Federal multi-agency body that would coordinate the development and implementation of the national plan.

5. There should be opportunities for public participation in the development and implementation of the plan; and

6. Consistent with the recommendation contained in NACOA's May, 1984 EEZ Report, Congress should be encouraged to establish an oversight mechanism that can give attention to the development and implementation of a national scientific exploration plan as part of its EEZ-related responsibilities.

The Coastal States Organization (CSO). The Coastal States Organization, an association representing the coastal States and territories of the United States, briefed NACOA on its concerns related to the development of a national plan. In the view of the CSO there are a number of benefits and costs associated with the development of our EEZ. National scale benefits include improved supply of important resources, reduction of trade deficit, food, economic growth, and national security. Benefits to be realized at the State and local level include increased employment, investment, and tax payments. However, a number of local environmental and socio-economic impacts will be associated with resource development. Thus, development of the EEZ should include coastal State input to the decision-making process. Although this study does not address coastal developments, NACOA agrees that coastal States should be invited to participate in the formulation and implementation of those elements of a national scientific exploration plan that deal with EEZ development off their coastlines.

Academia

The University National Oceanographic Laboratory System (UNOLS) briefed NACOA regarding the availability of oceanographic research vessels for use in a National EEZ exploration effort. UNOLS is neither a funding nor an implementing organization and thus has no EEZ program. Rather, it is an organization which provides a mechanism for the coordinated planning for and utilization of oceanographic facilities, primarily the academic research fleet. The 18 member institutions and 35 associate members work together and with the Federal funding agencies to assist in the effective use, assess-

ment, and planning for the oceanographic facilities required for marine research and education. Insofar as the EEZ is concerned, UNOLS is the organization that works with the academic institutions to provide effective scheduling of the research vessels that operate in the U.S. EEZ and worldwide.

UNOLS has become increasingly concerned about the gradual reduction of the efficiency of the academic research fleet due to the increasing age of the vessels. Consequently, it established a Fleet Replacement Committee to evaluate the present status of the fleet and to make recommendations for the orderly replacement of overage vessels. Although the larger vessels may occasionally work within 200 miles of the mainland, it is primarily the Class IV ships (100-149 ft. in length) that work within the EEZ. CAPE FLORIDA and CAPE HATTERAS, both operated by NSF, were built in 1981 and should see many years of service. Others are older, going as far back as 1948; for example, VELERO IV of the University of Southern California. The UNOLS Fleet Replacement Committee has recommended one new Class IV vessel specialized for geological and geophysical research be constructed within the next five years and six more Class IV's be built between the years 1990 and 2015. NACOA was reminded of the importance of the UNOLS ship replacement program and the new construction of research vessels for use in the EEZ. The ship replacement problem is a critical one for the future of U.S. oceanographic research, and UNOLS suggested the need for finding a solution to this problem.

In another area related to the involvement of the academic community in the national scientific exploration plan, as discussed in detail in Chapter 5, NOAA and USGS have established a program of precise bathymetric mapping within the EEZ. Neither agency is prepared to fund the additional cost of adding a suite of geophysical observations to the bathymetic surveys; but, would, if arrangements could be worked out to the benefit of the government, be willing to be the Federal host for such an effort. No charge for Government ship time would be assessed to an acceptable geophysical observing institution from the academic community acting in a joint operational mode with these agencies.

An opportunity therefore exists for a group of clients (mostly from industry) to acquire geophysical data within the EEZ at low cost to NOAA and USGS. One example of such an arrangement was brought to NACOA's attention during a briefing by NOAA. The plan described called for industry clients to participate in project design and funding. They would receive gravity, magnetic, and reconnaissance seismic data. The data would remain proprietary (except for research purposes) to the clients for five years. The academic institution could establish an EEZ Research Center to carry out the operations of this cooperative government, industry, university effort. The academic institution would develop a proposal regarding private sector sponsorship which could be forwarded to potential clients. The aca-

demic institution could use the mechanics of a Memorandum of Understanding (MOU) with NOAA and USGS regarding Federal participation in the project. The MOU will provide for the establishment of a cooperative relationship between parties falling into three broad categories: government (NOAA and USGS), industry (consortium sponsors), and the university community. While all parties would have a mutual interest in the collection of geophysical data in the EEZ, it is recognized that each has its own particular objectives in participating in the consortium:

1. The intent of NOAA and USGS would be to enhance the efficiency and effectiveness of efforts to map the EEZ by providing for the collection of important geophysical data beyond that which can be supported by direct federal funding.

2. The intent of the lead academic institution is to provide a mechanism for expanding research opportunities for faculty and students and other universities and thereby to contribute new knowledge and understanding of the EEZ.

3. It is presumed that it will be the intent of consortium sponsors (industry) to obtain reconnaissance geophysical data in unexplored areas in order to improve their ability to make long-range plans for exploring and exploiting the mineral resources of the EEZ.

NACOA believes that arrangements for government, academia, and industry cooperation will be essential to the development of an effective national scientific EEZ exploration plan.

Appendix E

GLOSSARY

Baseline environmental data - Data collected for the purpose of describing typical conditions. These data can then be used to determine long-term changes in the environment.

Data classification - The withholding of data from the general public for purposes of national security.

Data management - A coordinated planning effort designed to efficiently deal with large amounts of data.

Exploration - This report uses the term "exploration" in a general sense which is different from the term as applied to Federal mineral related activities. Department of Interior regulations define exploration as the process of searching for minerals. Data collected by industry during mineral exploration must be held proprietary for a period of time. Data resulting from research studies, under the same regulations, will be made available to the public at the earliest practicable time. This report has as its focus the scientific exploration of the EEZ. This is to be distinguished from mineral exploration, as defined in Federal regulations, which is intended to lead directly to commercial development of a specific resource and which may involve the production of proprietary information.

Gas hydrates - A solid, ice-like mixture of water and natural gas. It forms well above the freezing point of water when gas and cool water are brought together under very high pressures, e.g., on the floor of the deep ocean.

GLORIA - Geological LOng Range Inclined Asdic - A sidescan sonar to map the sea floor of our EEZ. The GLORIA system uses sound to locate and map variations of ocean bottom topography. The instrument is based on the principle that these variations will alter the amount of energy in the signal that bounces back to a receiver. The product of the system is an acoustical picture of the sea floor.

Hard mineral - Any non-fuel mineral, e.g., manganese nodules, ferromanganese crusts, phosphorites, marine placers, sand and gravel. It excludes oil and gas, and usually sulfur.

High-resolution - Data or information that gives a detailed picture of the parameter being described.

Hydrothermal vents - An opening at the sea floor surface through which seawater, heated in the earth and circulated through the fractured volcanic rocks of the oceanic crust, is ejected. Metals from the rocks are dissolved in the hot water and may be deposited on the sea floor as polymetallic sulfides.

International Decade of Ocean Exploration (IDOE) - It was an internationally coordinated program of oceanic exploration and research lasting from 1971 to 1980.

Magnuson Fishery Conservation and Management Act of 1976 - The main legal mandate of the National Marine Fisheries Service. It authorizes the Federal Government - in cooperation with commercial fishermen and other private citizens - to manage most fishing within the 200 nautical mile Fishery Conservation Zone.

Manganese crusts - Also called cobalt-rich ferromanganese crusts, they are mineral deposits of manganese and other metals found as pavement-like deposits (e.g., on the Blake Plateau) or as thin layers on the flanks of seamounts. They contain valuable concentrations of manganese, nickel, cobalt, platinum, and vanadium. They form on steep, raised areas (seamounts) or current-swept plateaus on consolidated rock surfaces that are too steep for permanent sediment accumulation and/or are swept free of sediment by strong currents.

Multibeam swath surveying - Swath surveying technology uses multiple sonar beams to map a region of the sea floor. Contours of sea floor relief can be produced by computer directly aboard the survey ship. The results of these surveys are very high resolution bathymetric maps.

National Academy of Sciences - A private society of distinguished scholars in scientific and engineering research, dedicated to the furtherance of science and its use for the general welfare. Its charter, an Act of Incorporation passed by the U.S. Congress and signed by Abraham Lincoln on March 3, 1863, named the first 50 members of the Academy.

National Science Foundation - An agency established in 1950 under the National Science Foundation Act of 1950. As an independent agency of the Federal Government, it is the U.S. Government's science organization.

NOAA Fleet - The fleet consists of 22 ships ranging in length from 65 to 303 feet, each designed for a specific type of ocean or coastal survey and research in order to gather the data and information needed to administer NOAA's programs. The ships are operated by civilian crews, research scientists and officers of the NOAA Corps.

Outer continental shelf - This includes all submerged lands lying seaward beyond three geographical miles distant from the coast line and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control.

Outer Continental Shelf Lands Act (OCSLA) 1953 Public Law 83-212 (amended 1975 and 1978) - An Act to provide for the jurisdiction of the United States over the submerged lands of the outer Continental Shelf, and to authorize the Secretary of the Interior to lease such lands for certain purposes.

Polymetallic sulfides - Members of a series of mineral deposits that have precipitated from hot, aqueous solutions related to submarine hydrothermal or volcanic activity. They are generally associated with sea floor spreading centers or mid-ocean rift zones.

Proprietary data - Data, owned by one group, that can only be used or sold by the owners.

Reconnaissance - A general examination or survey of a region, usually followed by a more detailed survey.

Renewable energy sources - Sources of energy that are not depleted or exhausted. Examples include: ocean thermal energy conversion (OTEC), tidal power, biomass, solar, and wind.

Sovereign rights - Sovereign rights over the resources, living and non-living, implies ownership and total authority over the resource excluding highly migratory species.

Strategic resource - A natural resource that is of a national significance.

Survey - To take a general or comprehensive view of or appraise.

United Nations Convention on the Law of the Sea (LOS Convention) - An international cooperation that established a legal order for all uses of the ocean; that would provide for peaceful uses of the oceans, equitable and efficient use of resources, conservation of living resources and protection and preservation of the marine environment. The Convention was negotiated from 1973 to 1982. To date, 159 countries have signed it and 29 have ratified it. The United States did not sign it because of a dispute over the provisions of the deep seabed mining. The Convention comes into effect one year after 60 nations ratify it.

Appendix F

NACOA Panel on the Exclusive Economic Zone

Chairman
Lee Gerhard

Panel Members

Charles Black
William Brewster (to 11/6/85)
Edward Gladish
Judith Kildow
Vernon Scheid (to 1/25/85)
Gordon Snow
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National Advisory Committee on Oceans and Atmosphere

The National Advisory Committee on Oceans and Atmosphere (NACOA) was established by Public Law 95-63 to advise the President and the Congress on national ocean and atmospheric policy, coastal zone management, and marine and atmospheric science and service programs of the United States. Its 18 non-Federal members are appointed to 3-year terms by the President from eminently qualified individuals with expertise in the following atmospheric and marine areas of direct concern to the Committee: science and technology, industry, State and local government functions, coastal zone management, and national policy.

NACOA's assessments and recommendations are provided in an annual report to the President and the Congress. In addition, NACOA's counsel may be provided through special reports, position statements, and direct correspondence to senior officials in Federal agencies and departments and to individual members of the Congress. The Committee's recommendations also are presented through testimony at Congressional hearings.